Virginia MEDICAL MONTHLY

OFFICIAL PUBLICATION OF THE MEDICAL SOCIETY OF VIRGINIA

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CONTENTS

Guest Editorial. John P. Williams, M.D., Richmond, Va.---- 513

The Differential Diagnosis of Medical and Surgical Jaundice. M. Morris Pinckney, M.D., F.A.C.P., Richmond, Va.---- 515

Antibiotics and Chemotherapy in Surgical Disease. William R. Sandusky, M.D., Charlottesville, Va. ---------- 520

Psychiatric Implications in Gereology. Daniel D. Chiles, M.D., and James P. King, M.D., Radford, Va. --------- 531

The Diagnosis and Treatment of Ruptured Cervical Disk. James L. Thomson, M.D., Norfolk, Va. ---------- 537

Psychosomatic Medicine: Mechanisms Common to Some Gastro-Intestinal Dysfunctions. John F. Williams, M.D., Richmond, Va. ---------- 540

The Use of the Male Sex Hormone in the Inhibition and Suppression of Lactation. Joseph C. Parker, M.D., Richmond, Va. ---------- 543

Clinical Pathological Conference. Harry Walker, M.D., Editor, and William Kay, M.D., Associate Editor ---- 545

Continued on page 6.

JOSEPH PRICE ISSUE

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Virginia Medical Monthly

Vol. 77, No. 10
WHOLE No. 1180

RICHMOND, VA., OCTOBER, 1950

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GUEST EDITORIAL

Civilian Defense

WITH World War III apparently imminent, recent experience at London, Tokyo and especially Hiroshima and Nagasaki brings sharply to the front the absolute necessity for proper planning and coordination on the home front. Modern warfare has literally brought the battle to the door step and there is no safe place under the sun. Furthermore, the day when the conqueror can live on the vanquished in the field has passed forever and the home front must not only protect and maintain itself but must produce prodigiously if war is to be carried to a successful conclusion.

In these troublous times it behooves each of us to be thinking seriously on the matter of what he can do best to condition his community, his State and his Nation for whatever ordeal may be ahead of us. Some of us may actually be of most value right at home since upon the health and productivity of the civilian population depends the ultimate outcome of the conflict. Others of us, the younger and more vigorous, may be indispensable on the battle field, while a large middle group must be prepared not only to help maintain the home front but also to defend against disaster which the enemy may inflict upon us as an integral part of his general offensive.

The role of the physician in disaster is usually thought of as that of a kind of special agent of the Almighty, but since the Lord has not yet seen fit to release him from his mortal limitations as to time and space, it seems obvious that with the magnitude of the atomic disaster of the present day, there will never be enough of his kind to fully meet demands, hence his utmost efforts will have to be confined rigidly within his own special field. This does not imply that his voice should not be both heard and heeded in the planning councils since no one knows so well as he both his capabilities and his limitations in preserving that which is most precious to all the population, health and life.

I wonder how many of us have thought seriously about the tremendous efforts which must be made by other members of the disaster team before the doctor even sees his patient. First, the stricken area will have to be isolated by a cordon of police and home guards drawn from peripheral areas to prevent radiation injury to unwary souls anxious to render assistance.

Finally, the Geiger counter squads will enter the area from the perimeter followed by firemen, labor gangs to dig through the rubble of collapsed houses, highway gangs with bulldozers to open streets to fire equipment, wrecking cranes, ambulances and other motor transport. Public utility crews will have to restore water supplies as soon as possible for fire fighting and close off broken gas mains which might add to the general conflagration. If the disaster has come by night, which is most probable, all of these confused activities must be carried on in the glare of a burning city since power would have to be cut off to prevent further fires and electrocutions.

When the broken bodies begin to emerge from the maelstrom to the first aid stations located in schools and churches in the peripheral areas and manned by very few doctors but many laymen who have been trained in first aid, the doctor will find him-

self engaged almost entirely in supervisory functions, deciding which cases should be evacuated immediately, which must be given plasma and blood before evacuation and tragically, which are beyond help and must just be made as comfortable as possible. Save for ligation of severed vessels and application of splints and bandages, there will be little surgery at this level; and as for medicine, the antibiotics, morphine, blood and plasma will have to suffice.

If planning has been thorough, the next step in the line of evacuation will be nearby hospitals where definitive surgical treatment may be undertaken as a life-saving measure, and those 20 to 50 miles away where the less critically injured may be cared for. By prearrangement the staffs of such hospitals should have been augmented within a matter of an hour or two and before the arrival of patients. It is in this zone that the greatest saving in life should accrue.

The final step in evacuation will be chiefly to the larger population centers or to prepared evacuation areas where the convalescent, the homeless and the destitute will be cared for until rehabilitation can begin.

When one stops to consider that there are only about 1,600 hospital beds in our largest city, one might be tempted to call this disaster relief problem insoluble, but there are hundreds of doctors scattered throughout the State who have treated thousands of wounded boys successfully under primitive conditions in the bitter cold and under canvas and they have lost none of their know-how or powers of improvisation. We have also untapped sources of good will toward our neighbors and fixed determination to see this tragedy through to a successful conclusion so that our children may survive and live in peace. With such stuff battles are won.

The Society is determined to cooperate to the very fullest with Governor Battle and his Council for Civilian Defense and knows that its individual members will do likewise, each in his own sphere of activity.

JOHN P. WILLIAMS, M.D.,
Veterans Administration Hospital,
Richmond, Virginia.

EDITOR'S NOTE: Dr. Williams is chairman of the National Medical Emergency Committee of the Medical Society of Virginia.

Floral Eponym

Caralluma Aucheriana

AUCHER-ELOY, PIERRE MARTIN REMI. 1793-1838

AUCHER-ELOY was a French pharmicist, who gave up pharmacy to become a publisher, and then in 1830, gave up his publishing business to devote himself to botanical exploration.

Caralluma belongs to the asclepias or milkweed family. There are about 40 species, found in Spain, Africa and Arabia.

THE DIFFERENTIAL DIAGNOSIS OF MEDICAL AND SURGICAL JAUNDICE*

M. Morris Pinckney, M.D., F.A.C.P.,
Richmond, Virginia.

The differential diagnosis of medical and surgical jaundice is sometimes simple, often difficult, and always hazardous. A carefully taken and minutely detailed history is undoubtedly our most effective means of arriving at the correct diagnosis. Snell[1] has well stressed the advantages that we practicing physicians have in studying a jaundiced patient by being able to see the case in its early stages. He remarks that an accurate chronologic history must pay "particular attention to three points: (1) the symptoms which either immediately or remotely preceded the onset of jaundice; (2) possible exposures to virus hepatitis and to hepatotoxic agents," especially dried blood plasma; and "(3) a detailed description of any pain which the patient may have suffered before or since jaundice made its appearance."

Examination of the patient must include notation of the color of the skin, sclerae, and buccal mucous membranes; search for spider nevi, telangiectases and distended veins; palpation of cervical and other lymph glands; palpation and percussion of the liver and right costovertebal angle for tenderness; palpation for a distended gallbladder, right upper quadrant tenderness, and ascites; and inspection for presence of peripheral edema.

We shall attempt to simplify the problem if possible by recalling the essential physiology of bile production, the clinical symptoms of jaundice, and shall submit such laboratory tests as seem proven by experience to be worthwhile and not too complicated.

The bile pigments are manufactured from the breakdown of hemo-globin and possibly other pigments by the reticulo-endothelial system of the body, especially in the marrow, spleen and liver. This conversion from hemoglobin to bilirubin-globin, effected by the reticulo-endothelial cells, supplies to the general circulation a large amount of protein-bound pigment, which is nondialyzable and which produces a delayed or indirect type of van den Bergh reaction.[2] This protein bound pigment, bilirubin-globin, does not produce an immediate color reaction with van den Bergh's diazo compound, but, following the addition of alcohol to precipitate the protein, the delayed or indirect reaction is obtained. The indirect or delayed reacting bilirubin-globin is carried in the general circulation to the liver, when passage through the liver cells of the hepatic cords transforms this pigment into sodium bili-rubinate, or bilirubin, which produces the direct or immediate type of diazo reaction.

Bilirubin passes through the bile channels of increasing size to the duodenum where bacterial action chemically reduces this substance to urobilinogen and stercobilinogen. Most of the urobilinogen is reabsorbed into the portal circulation and returned to the liver for reconversion to bilirubin.

Other constituents of bile, probably produced by the hepatic cells, are the bile salts and cholesterol esters, diminished when hepatic function is disturbed and increased in the blood when dammed back by a block in bile channels.

Clinical classifications of jaundice have been suggested by many writers, notably Rich,[3] McNee,[4] Watson[5] and more recently Ducci[6] who presents an understandable, working classification. Ducci divides jaundice into 3 types: the pre-hepatic, the hepatic, and the post-hepatic. The pre-hepatic includes hemolytic and non-hemolytic forms, the most frequently encountered being the well known congenital hemolytic jaundice. The hepatic type is subdivided into hepatocellular and hepatocanalicular forms, these being evidenced by injury or disease of the liver itself. The post-hepatic type results from complete or incomplete obstruction of the bile ducts outside of the liver.

In general the pre-hepatic and hepatic types are considered to be "medical jaundice" while the post-hepatic type is "surgical jaundice."

Thus we are seeking to distinguish between jaundice originating in one of three places, as illustrated by this simplified drawing. The pre-hepatic type is the jaundice due to pathology in the reticulo-endothelial system primarily; the hepatic type is that originating in the liver itself, and the post-hepatic type, that resulting from interference with

*Read before the annual meeting of the Medical Society of Virginia at Fort Monroe, October 9-12, 1949.

XUM

the flow of bile from the liver to the duodenum. Prompt differentation of types is obviously important for the welfare of the patient, and with this complex problem we are now concerned.

The presence of pre-hepatic, or the reticulo-endothelial type of jaundice, if it may so be called, usually offers no great diagnostic problem. Splenomegaly, recurring mild jaundice with anemia and fever,[7] associated with changes in the blood picture, increased indirect reacting type of bilirubin in the blood stream (for the liver does not participate in this disease), and acholuria indicate the diagnosis. Urinary urobilinogen may be normal or greatly increased, depending upon the load of the pigment delivered to the liver for transformation to sodium bilirubinate.

Before discussing the hepatic and post-hepatic forms of jaundice we wish to stress a few points concerning the recommended laboratory tests. Most writers agree that the van den Bergh reaction, both qualitative and quantitative, is extremely important, though the icterus index may be substituted for the latter. The Harrison "barium or filter strip" technic for the detection of bilirubin in the urine, we wish to emphasize, is apparently trustworthy and so simple as to be a bedside procedure.[8] Serial studies for urinary urobilinogen, employing Ehrlich's method, should be made on samples collected at the same time each day, such as 2 to 4 P. M., and promptly tested. The clay colored stool may be subjected to chemical analysis for bile, but it behooves us all to inspect personally the stools of the jaundiced patient. The cephalin-cholesterol flocculation test of Hanger is recommended as probably the most useful of the flocculation test to study parenchymatous disease, being of greatest diagnostic value in patients with jaundice of short duration. A prolonged prothrombin time indicates diminished formation of prothrombin due either to a lack of bile salts in the intestines preventing the absorption of fat soluble vitamin K, or to disease of the liver cells themselves preventing its manufacture. If to the jaundiced patient with hypoprothrombinemia, vitamin K is administered parentally and a dramatic reduction in prothrombin time occurs, one may consider the jaundice to be obstructive in type.

Hepatic jaundice, the chief group of medical jaundice, contains hepatocellular and hepatocanalicular types, known clinically as hepatitis and cirrhosis. The cellular and canalicular types do not appear separately and distinctly in practice as a rule but are blended together as in acute infectious hepatitis.

The clinical features of infectious hepatitis, so familiar during the war years and still appearing sporadically, include a grippe-like onset with anorexia as a prominent symptom, and few signs other than leukopenia, cervical adenopathy, and tenderness of the liver to percussion. With the onset of jaundice, enlargement of the liver is usually noted, together with tenderness in the right costo-vertebral angle.

Ordinary infectious hepatitis exhibits predominantly disturbances of function of the hepatic cells, but there are also associated evidences of varying degree of canalicular disease. Thus in the pre-icteric phase of acute infectious hepatitis, bilirubinuria may be detected by Harrison's test, and the van den Bergh reaction may show increased amounts of both immediate and delayed reacting pigment. Urobilinogen will be present in the urine in increased amounts during the period of increasing icterus, and then disappear, to return as jaundice subsides and healing progresses. Blood cholesterol and serum albumen are diminished in proportion to the extent of damage to the liver cells. The cephalin-cholesterol flocculation test of Hanger becomes positive early in the course of the disease and may remain positive or abnormal even after the disease is considered cured. The alkaline serum phosphatase may remain normal or be elevated early in acute hepatitis depending upon the degree of involvement of the canaliculi. Though most present-day writers state that no significant increase of alkaline phosphatase occurs in early infectious hepatitis, we[9] found in our series of more than 1,200 cases observed in the Italian Theatre in 1943 to 1945 that approximately three-fourths showed abnormal phosphatase values. Perhaps the virus in Italy exhibited a predeliction of the ampullae and canals. Significant prolongation of the prothrombin time, though not frequently observed, is always indicative of severe hepatitis, and may be found in fulminating cases early in the disease. We found little advantage in employing such function studies as the glucose tolerance and hippuric acid tests.

Watson[1,10] believes that the canalicular form may be seen in the chronic hepatitis with or without evi-

XUM

dent clinical jaundice. These cases, of which we will probably see more and more as a result of the great epidemic of World War II, present symptoms such as pruritus and laboratory data typical of regurgitation of obstructive jaundice. Evidence of reduced hepatocellular function is usually lacking. Watson states that "in the absence of sufficient evidence to indicate intra-hepatic biliary obstruction, it is believed that the continued regurgitation of bile supports the concept of increased permeability of the cholangeoles. This regurgitation is manifested by a prompt direct hyperbilirubinemia, hypercholesterolemia, and hyperphosphatemia." He further believes that this pathology should be considered a transition from hepatitis to cirrhosis of the chalangeolitic type. Biopsy of the liver tissue is of great help in a study of this most perplexing jaundice.

Whereas hepatic jaundice, therefore, connotes disturbance of liver cell function, post-hepatic jaundice indicates partial or complete interference with the drainage of bile from the liver to the intestines.

Calculous disease of the gallbladder and ducts is usually associated with a long history of dyspepsia, intolerance to fats, upper abdominal colic and frequently transient jaundice. In an acute attack, colicky pain is marked, chills and fever usually present, nausea and vomiting protracted, jaundice varying in intensity from day to day, tenderness and spasm present in the right upper quadrant, occasionally the gallbladder distended, and leukocytosis present.

We must bear in mind also the possibility of pancreatic disease and carcinoma of any abdominal viscus. Carcinoma of the head of the pancreas, though usually described as producing a painless, progressive jaundice in a patient over forty years of age, may produce recurring attacks of right upper quadrant pain or generalized abdominal pain, usually associated with weight-loss and diarrhea.

The differential diagnosis of jaundice may sometimes be clarified by X-ray studies, particularly the use of flat plates of the abdomen to identify stones in the duct, or the passage of barium through a widened duodenal arch to suggest carcinoma of the head of the pancreas. The duodenal tube is particularly recommended by clinicians to detect the presence or absence of bile in the duodenum, as well as to detect the presence of blood, so suggestive of malignant disease of the biliary tract.

If the blockage is complete and no bile reaches the intestines, there will be, of course, no bile in the stools, and a damming back into the general circulation of all normal constituents of the bile. Thus, our tests demonstrate jaundice due to accumulation of prompt reacting bilirubin and increased values for cholesterol and serum phosphatase. If the prothrombin time is prolonged, administration of vitamin K should effect a reduction. Bile overflows into the kidneys, and the urine exhibits a positive Harrison test.

Since most cases of obstructive jaundice are incomplete and caused by a ball-valve action of a stone in the bile duct, significant fluctuations in serum bilirubin will appear, the cholesterol and phosphatase roughly paralleling the sodum bilirubinate.

To summarize this complex problem, we note that the surgical jaundice patient frequently presents a history of long standing dyspepsia, previous attacks of colic sometimes associated with slight jaundice, chills and fever of considerable degree, a fluctuating degree of icterus of a greenish hue, pruritus in long standing cases, right upper quadrant abdominal pain and tenderness with spasm, and rarely a palpable gallbladder.

The medical jaundice case, on the other hand, except in cirrhosis, gives no history of antecedent colic or dyspepsia, may recall exposure to epidemic hepatitis or may have received blood plasma intravenously, complains primarily of anorexia and lassitude usually preceding by several days or a week the onset of jaundice, exhibits an orange hue to his skin, frequently enlarged glands in the neck, definite tenderness over the liver and costovertebral angle, and most frequently a liver enlarged and tender two to four finger breadths below the costal margin.

A composite picture of the laboratory tests differentiating medical and surgical jaundice, excluding pre-hepatic jaundice, reveals an increased prompt van den Burgh reaction in both instances, but with a delayed reaction in medical jaundice also; bile in the urine in both conditions, but urobilinogen present in medical jaundice; cholesterol, phosphastase and prothrombin time are increased in surgical jaundice while often diminished in medical jaundice. Serum albumen is often decreased in medical jaundice but not affected in surgical jaundice. And in

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complete post-hepatic obstruction the stools are acholic.

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Medical Arts Building.

DISCUSSION

DR. JAMES OTEY BURKE, Richmond: Dr. Pinckney has discussed the differential features of medical and surgical jaundice most completely in the time allotted him. I am in accord with everything he has said and shall only expand upon some of these features.

It should be stressed that the value of any test is increased by repeating it at a later stage of the disease. We may have a better chance of making a correct diagnosis of a type of jaundice with two sets of several familiar liver function tests done at an interval of one or two weeks, than with one set of many elaborate tests.

Slide 1: This slide shows the changing values of cholesterol esters in a case of infectious hepatitis with gradual return of the cholesterol esters to normal. It is to be noted that the total cholesterol remains approximately the same and that the cholesterol esters increase in absolute value, thereby giving an increased percentage of cholesterol esters with improvement in liver function.

Slide 2: This slide reveals the changing value of cholesterol and cholesterol esters in a case of extra-hepatic biliary obstruction as the jaundice deepens or as the obstruction continues. It is to be noted that the absolute value of cholesterol esters remains the same but with the increase in the absolute value of the total cholesterol, the percentage of cholesterol esters diminishes. This reveals the importance of knowing the absolute value of the total cholesterol and the cholesterol esters and the value of repeating tests during the course of the disease.

The duration and degree of jaundice are often helpful. A slowly progressive degree of icterus suggests surgical jaundice as does continued absence of bile in the stool, as well as diminished or absent urobilinogen. Dr. Pinckney has mentioned pain as an important differential symptom, one which we so frequently do not stress.

Slide 3: This slide reveals the values for urinary urobilinogen in various types of jaundice. It is taken from the paper of Dr. Cecil Watson, as noted. One comment on urobilinogen—it is important that twenty-four-hour samples be studied if we are interested in diminished values or particularly in absent readings. Watson has pointed out that neoplastic jaundice will usually leave consistently low values, below 0.5 mgm. %/24 hours. Another thing about urobilinogen studies is that they should be done on several days as hepatitis may yield low values the first few days.

I would also add that any test of parenchymal liver cell damage is likely to be of no value for differentiation if done late, since jaundice due to stone or cancer will eventually lead to liver cell damage by virtue of regurgitation. Thus the Hanger cephalin cholesterol flocculation test which depends upon an alteration in albumin: gamma globular ratio—or the thymol turbidity test which depends upon an alteration in the serum lipid-gamma globulin ratio, may be positive late in regurgitation jaundice.

The most difficult jaundice to clearly differentiate, as Dr. Pinckney pointed out, is the cholangiolar (or cholangiolitic) type. This type is usually chronic and manifested by a large liver, deep icterus and intermittently acholic stools. 1+ may produce the typical so-called Hanot's cirrhosis (jaundice and splenomegoly without ascites). Laboratory tests may reveal only three abnormalities: greatly increased bilirubinemia, cholesterolemia and phosphatasemia. Liver punch biopsy is most frequently necessary to make this diagnosis and we often have these patients surgically explored before a diagnosis is established.

Slide 4: Elevation of serum alkaline phosphatase has usually been associated with extra-hepatic obstruction. This slide depicts the serum alkaline phosphatase and serum bilirubin in a case of severe hepatitis of the cholangiolic variety. It is to be noted that there is an inverse relationship between the serum alkaline phosphatase elevation and the serum bilirubin elevation. This is contrary to the usual conception that serum alkaline phosphatase is elevated with an elevation of serum bilirubin. We think it is evidence that serum alkaline phosphatase elevation does not mean obstruction. We have other evidence on this.

Slide 5: The remarkable thing about this slide is the marked cholangiolar proliferation. Same case as Slide 4.

I would like to express my appreciation to Dr. Pinckney for allowing me to discuss his excellent paper.

DR. CHARLES M. CARAVATI, Richmond: The important thing in the interpretation of jaundice is to decide whether the patient should be treated medically or surgically; and Dr. Pinckney has very well outlined for us the course of procedure to be followed in making that decision. There are, however, two simple factors that may be emphasized. Number one is the daily gross inspection of the stool of the patient to determine whether it is clay-colored or has normal color. Regardless of the presence or absence of urobilinogen in the stools or urine, if the stools are normal in color and continue normal in color

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there is seldom need to call a surgeon. There is very little good the surgeon can do a patient who has adequate pigment in the stools, with the possible exception of a hemolytic syndrome due to hypersplenism.

The second point is the leukocyte count. The white count as a rule is increased in any type of surgical jaundice. That is not invariable; but, with the exception of Weil's disease, hepatic amebiasis, and the hemolytic crises, there is practically no medical jaundice in which the leukocyte count is raised.

Liver biopsy, to differentiate acute hepatitis from acute obstructive jaundice, is not too helpful. In both conditions, there is histo-pathologic evidence of stasis in the bile channels and inflammatory reaction, and the findings are not sufficiently specific to differentiate the two conditions in certain stages of the disorders.

Find Chloramphenicol Useful Against Bacillary Dysentery.

Good results in treating 35 patients for bacillary dysentery with chloramphenicol (chloromycetin, trade name) are reported by a research group from Washington, D. C.

"Diarrhea usually subsided within three days, and an uneventful recovery ensued in all 35 patients," according to Drs. Sidney Ross, Frederic G. Burke, E. Clarence Rice and John A. Washington, and Sara Stevens, B.S., all of the Research Foundation, Children's Hospital. (*J. A. M. A.*, August 26.)

Although sulfadiazine also is effective against the disease, its usefulness is limited, they point out. Causative microbes frequently become resistant to sulfa drugs, occasional patients are sensitive to sulfa compounds, and adminstering sulfadiazine to dehydrated patients in the tropical areas where the disease is most prevalent may be hazardous.

"Red Feather Month" in Virginia.

Governor Battle has designated October as "Red Feather Month" in Virginia and has called on the people to give generously to their Community Chest campaigns throughout the State.

The Red Feather, official symbol of Community Chest services, stands for united, voluntary action by citizens in working and giving to build better communities. It means united planning and fund raising for the voluntary social services of health and welfare.

The biggest of the Community Chest drives in the State will be the one for the Richmond area. An army of some 5,000 volunteer workers will take part in this campaign. They will raise money for 31 Red Feather Agencies serving the people of Richmond, Henrico County and the northern half of Chesterfield County.

Twenty-five Community Chests in the State will conduct their drives in October. They are Alexandria, Arlington, Bristol, Charlottesville and Albemarle County, Covington and Alleghany County, Danville, Fairfax County, Fredericksburg, Elizabeth City County, Hopewell, Lynchburg, Marion, Martinsville, Newport News and Warwick County, Norfolk, Petersburg, Portsmouth, Radford, Richmond, Roanoke, Staunton and Augusta County, Suffolk, Virginia Beach and Princess Anne, Winchester and Frederick County, and York County.

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ANTIBIOTICS AND CHEMOTHERAPY IN SURGICAL DISEASE*

WILLIAM R. SANDUSKY, M.D.,†
Charlottesville, Virginia.

The years succeeding Domagk's historic experience with prontosil[1] in 1935 have seen feverish and fruitful activity in antibiotic and chemotherapeutic research. In rapid succession new drugs have been discovered which have added to the effectiveness of our attack on disease caused by micro-organisms. These years have also witnessed a marked decline in surgical mortality. The many factors responsible for this accomplishment have been considered in detail by Lehman and Becker.[2] The role of antibacterial agents in this mortality reduction has been obvious and as a result there has developed justified enthusiasm concerning the value of these substances in the management of surgical disease. Unfortunately, in some instances, this enthusiasm has led to injudicious employment of these useful agents. They have become regarded by some as magic drugs and examples indicating disregard for the fundamentals underlying their use have been observed. For this reason a reconsideration of the basic principles governing the use of antibiotic and chemotherapeutic agents together with a summary of the present position of specific drugs in surgical disease appears to be timely.

PRINCIPLES OF CHEMOTHERAPY IN SURGERY

Chemotherapeutic and antibiotic agents have two functions in the management of the surgical patient. One is a prophylactic function, the other, a therapeutic function.

Prophylactic Function. From the prophylactic standpoint these drugs are used to prevent or to minimize infection in contaminated operative fields. The first such employment dates from the experience of Jensen, Johnsrud and Nelson[3] who applied sulfanilamide directly to the wounds of compound fractures with the idea of preventing infection. Present-day application of the prophylactic principle covers the use of these agents, (1) in contaminated accidental wounds of soft parts and bones, (2) as intestinal antiseptics, and, (3) to prevent or to minimize spread of infection when operations are conducted in or adjacent to tissues already the site of established infection.

Prior to the entry of our country in World War II the National Research Council instituted, in nine hospitals in different parts of the country, a study of the sulfonamides as preventatives against wound infection in civilian accidental wounds. Over 2,000 wounds were studied and as a result it was concluded[4] that the use of sulfonamides, either systemically or locally or combined, does not materially delay the onset or reduce the incidence or the severity of local infections in wounds, nor eliminate pathogenic organisms from them. This study indicated, however, that the use of sulfonamides minimizes the spread of the localized infection into the general circulation and thereby reduces the incidence of septicemia and death. Moreover, the carefully analyzed figures from this study showed that when the local conditions favor infection, the control cases, in which no drug was given, on the whole did better than the drug treated cases. Military experience[5,6] confirmed these observations concerning the sulfonamides and added information which included penicillin. Neither of these drugs can prevent the growth of bacteria in blood clot, serum, and devitalized tissue, nor do they prevent the absorption of toxins produced by bacteria growing in such media. Local chemotherapy cannot sterilize an incompletely debrided wound. The primary prophylactic usefulness of sulfonamides and penicillin is to protect living tissues from invasive infection.[5] The introduction of the newer agents in no way alters this principle.

The development of a drug which can be taken orally without being absorbed by the alimentary canal and which is effective against the micro-organisms normally inhabiting this region led to the adoption of intestinal antisepsis in the preparation of patients for operations on the gastro-intestinal tract. This principle is directed at the prevention of peritonitis as a complication following such operations. The first drug used for this purpose was sulfaguanidine (sulfanilylguanidine),[7,8,9] but its par-

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*Read before the annual meeting of the Medical Society of Virginia at Fort Monroe, October 9-12, 1949.

tial absorption and potential toxicity led to the employment of sulfasuxidine (succinylsulfathiazole),[10,11] sulfathalidine (phthalylsulfathiazole),[11,12] and streptomycin.[13] Two other agents effective against its bacterial flora but not absorbed by the gastro-intestinal tract, namely, bacitracin and polymyxin, are as yet incompletely evaluated as intestinal antiseptics. Lockwood[14] recently pointed out the conflicting nature of the reports dealing with streptomycin as an intestinal antiseptic and has reported a study conducted in his own laboratory in which the results with this drug were inconsistent. Moreover, the probable development of resistance to streptomycin by the intestinal organisms would be likely to render the parenteral use of the drug ineffective should the patient develop postoperative complications which might ordinarily be treated with this drug. Lockwood feels that it would be wiser to reserve the use of streptomycin for the treatment of complications should they develop rather than to expend the drug effect in the preoperative preparation of the patient.

It has been stated[5,15] that a cleanly incised wound needs no chemotherapy. Our own experience[16] with early and adequately debrided war wounds substantiates this concept. Nor is chemotherapy required for the clean uncontaminated operative wound. On the other hand, a patient with a contaminated operative wound or one who has been operated upon for serious infection has a better chance of escaping or minimizing spread of infection if chemotherapy is administered in adequate dosage prophylactically than if it is not.[17] An outstanding example of the application of this principle is contained in the controlled study by White and his coworkers[18] in which the prophylactic use of penicillin in pulmonary resection was responsible for a significant decrease in postoperative infective complications.

Therapeutic Function. From the standpoint of therapy of established infections, Lockwood[19] has pointed out that certain characteristics of a clinical lesion must be present if successful results are to be expected. First, the infecting organism must be sensitive to the drug used. This implies that identification of the organism by culture must be made at the earliest possible time. In rapidly developing infections of great virulence such as lymphangitis or cellulitis from which recovery of the organism is not immediately possible, it is permissible to employ drugs of low toxicity which are known to be effective against the organisms most commonly associated with these infections.

Second, for systemic use the blood supply to the area of infection must be adequate to permit transport of the drug in effective concentration. This is usually the case in acute surgical infections, but is not apt to be the case in chronic infections where the infected area may be relatively isolated from the blood and lymph stream by the previous development of dense avascular connective tissue underlying the pyogenic membrane. Although an isolated lesion will not be responsive to systemically administered chemotherapy it may yield to local application of the agent.

Third, there must be no substance which neutralizes the drug in the area where its effect is desired. With the sulfonamides, for instance, the products of tissue necrosis prevent action by competing with the drug for the metabolic needs of the bacteria. This means that the sulfonamides are not effective where there is suppuration and tissue death. Similarly, the effectiveness of penicillin may be inhibited by the presence of a specific enzyme, penicillinase, developed in the lesion by organisms such as the colon bacillus.

Fourth, the usual defense reactions of the host to infection, such as phagocytosis, must be active. Most of these drugs inhibit rather than destroy bacteria; the final disappearance of the infection depends on the local defenses of the body.

Although it is true that a considerable number of surgical infections will disappear rapidly when properly treated with antibiotics or chemotherapy, the fundamental long established principles of treatment must not be neglected. These include rest and adequate nutritional and fluid maintenance in all cases, heat in many, and surgical decompression or drainage in properly chosen ones. Selection of the latter is perhaps the most difficult problem in the use of these drugs in surgery; and the results of neglecting surgical indications are seen frequently in cases in which surgical intervention at the right time might well have saved important structures.

The general principle of surgical drainage when localization and abscess have occurred is undisputed. The removal of small collections of pus by means of needle aspiration and the instillation of an appropriate drug is an acceptable modification of this well founded principle.

Conversely, non-operative treatment before local-

XUM

ization has occurred is equally sound provided the tissues which are at the site of bacterial activity are intact, well vascularized and unthreatened by pressure. Cellulitis, lymphangitis, lymphadenitis, and infection of serous cavities in their early stages usually meet these requirements.

There is another group of unlocalized infections characterized by the building up of pressure within a closed space. Although early in the process the vascular supply is intact, rapidly developing pressure may both (1) limit the local resistance and prevent the access of drug to the area by diminishing the blood flow and (2) cause necrosis of tissue. Infections of the tendon sheaths, fascial spaces, hollow viscera and bone marrow are examples of such lesions. In these conditions prompt surgical intervention supplemented by the appropriate drug is obligatory. The operative procedure should consist of decompression where vital structures are concerned and extirpation of the lesion when the diseased organ (e.g., the vermiform appendix) can be spared.

In this connection, it must be stated that in the case of acute osteomyelitis all observers are not in accord with the program of early operation. Although the results of non-operative management of this infection are sometimes striking, it is not always possible to predict accurately the course as regards bone loss and as a result necrosis of large segments of bone may occur while waiting, possibly with futility, for the drug to be effective. In judging this matter one must understand what the aim and method of surgical intervention is. Its aim is single and clear—decompression of an area which is being asphyxiated by unreleased pressure, so that an effective local circulation can supplement the action of any drug employed. In no sense is it to be considered as "drainage". Logically, therefore, the surgical method chosen provides for decompression alone, although in most instances a drain must be employed so that the escape of exudate may be provided and further pressure avoided. The closed space must be opened only and drains must go no deeper than the opening. It is essential in these operations to protect the infected area from any manipulation. The process within the space is in the stage of cellulitis and it is as dangerous and illogical to incise the content or to thrust an exploring instrument into it as it would be to incise a subcutaneous cellulitis.

Finally, there is a group of infections, late ones, in which communication between blood and lymph channels and the site of bacterial activity is interfered with by the interposition of a dense avascular barrier. As a result contact of drug with bacteria cannot be effected. Cavities, sinuses and fistulae with fibrotic walls and ulcers with scarred bases are typical examples of such lesions. Recovery will depend upon operative intervention the aim of which is the re-establishment of vascular contact.

The treatment of surgical infection demands the proper use of all logical methods. Certainly the chemotherapeutic and antibiotic agents are adjuvants of enormous value; but they must be considered as only a part of the therapeutic team. They must never be omitted in serious infection; but they must not be the sole reliance of the physician.

SPECIFIC ANTIBACTERIAL AGENTS

The remaining portion of this paper will be devoted to brief comments concerning several specific antibacterial agents with particular regard to their present position in the management of surgical disease.

Sulfonamides. Domagk's[1] experimental results with prontosil were put to clinical trial by Colebrook and Kenny[20] and others. The effective component of prontosil was identified as sulfanilamide, a chemical which had been known for many years. There followed an extended use of this drug as well as the development of many different derivatives. The sulfonamides have a wide range of activity against both gram-positive and gram-negative bacteria. Many of these organisms are responsible for surgical infections and the usefulness of this group of drugs in surgery became established very early.

Unfortunately the sulfonamides are inactivated in clinical lesions in the presence of the products of tissue breakdown. This has limited their effectiveness in surgical infections which are so frequently characterized by the presence of pus, necrotic material, and devitalized tissue. Moreover, an additional limitation to sulfonamide therapy is its toxicity. Both of these limitations have been effectively met by other drugs and many of the early uses of the sulfonamides in surgery are now accomplished by less toxic and more effective agents. At present the sulfonamides are of value as intestinal antiseptics, in bacillary urinary tract infections, and in conjunction with other agents in the treatment and prevention of peritonitis of fecal origin.

Penicillin. Many of the limitations of the sul-

fonamides were met by the introduction of penicillin. This antibiotic was discovered in 1929 by Fleming[21] who predicted that it might be used clinically. This was finally accomplished by Florey, Chain and their co-workers[22] who demonstrated its clinical effectiveness. The chief virtues of penicillin are its almost complete lack of toxicity and its wide range of bacterial inhibition, which is unaffected by the products of tissue breakdown. It is now the agent of choice in the management of surgical disease due to staphylococci, streptococci and pneumococci. Certain of the actinomycetes are penicillin sensitive and infections due to them respond dramatically. Penicillin is effective *in vitro* against the clostridia of gas gangrene and experimental infection in animals can be prevented. Although individual experiences with gas gangrene in World War II varied, the consensus is that it is an effective agent, if not in preventing this dreadful infection, certainly in reducing its morbidity and mortality. In addition to infections caused by the organisms already mentioned other surgical infections due to penicillin sensitive organisms in many instances are favorably affected. This is particularly true, for example, in pleuropulmonary infections of surgical nature, both from the therapeutic as well as the prophylactic standpoint.

The outstanding limitation of penicillin is its inactivation by an enzyme called penicillinase[23] which is produced by certain gram-negative organisms; therefore, the range of usefulness of penicillin particularly in mixed infections is somewhat narrowed. The recent introduction of long acting forms of penicillin has greatly enhanced the ease with which the drug is administered and has improved considerably its clinical application.

Streptomycin. In 1943, Waksman and his colleagues[24] discovered an actinomycete, streptomyces griseus, that produced a relatively non-toxic antibiotic, which they named streptomycin. It is extremely active *in vitro* against gram-negative and gram-positive bacteria. From the standpoint of the surgeon the introduction of a new antibiotic which includes in its antibacterial spectrum organisms usually indifferent to the action of the sulfonamides and penicillin was most welcome. This was particularly true as regards the susceptibility of gram-negative bacilli and non-hemolytic streptococci to streptomycin.

One of the principal applications of streptomycin in surgical disease is its use together with other antibacterial agents in peritonitis of fecal origin.[25-29] It is also effective in other infections caused by streptomycin sensitive organisms such as bacillary urinary tract infection,[30] soft tissue infection,[31] and septicemia.[32] Infection with bacterium tularense which in some instances has surgical implications is responsive to streptomycin therapy.

When administered orally streptomycin is neither absorbed nor destroyed in the gastrointestinal tract. This fact gave hope that it would prove useful as an intestinal antiseptic and, indeed, reports[26,27,33] concerning its effectiveness in this role have appeared. A recent study by Lockwood[14] casts some doubt on the value of streptomycin in this connection, and on the basis of his report it would appear that the sulfonamides continue to be the drugs of choice in preoperative preparation of the intestinal tract for surgery.

Extremely heartening reports concerning the use of streptomycin in tuberculosis have appeared. The work which has been done principally in Veterans Administration Hospitals is summarized in a recent report.[34] From the surgical standpoint the consensus is that streptomycin is of value in treating tuberculous lymphandenitis and tuberculous peritonitis. Bone and joint lesions, genitourinary infections, and cutaneous sinuses and fistulae due to the Mycobacterium tuberculosis respond favorably when streptomycin is combined with the appropriate operative therapy. It is helpful in the painful and crippling tuberculous involvement of the larynx and is also employed prophylactically to prevent or to minimize the spread of tuberculosis following pulmonary resections for pulmonary tuberculosis.[35]

The collaborators in this study agreed that the routine use of streptomycin following thoracoplasty for pulmonary tuberculosis is not justified. It is preferable to withhold streptomycin and give it only if extension of the disease develops postoperatively. The line of reasoning in this connection is based upon the ease with which Mycobacterium tuberculosis develops resistance to streptomycin. One must be reluctant to use it in any condition which could be expected to respond favorably without its use, lest one be faced with a life-theatening episode in the future and be unable to employ it with any likelihood of success. The same rationale is advanced by Lockwood[14] in connection with the use of streptomycin as an intestinal antiseptic.

One of the great disadvantages to streptomycin

XUM

therapy has been the toxicity of this drug.[36] Untoward reactions are not uncommon and their incidence becomes more frequent with increasing dosage.[37] They consist of histamine-like reactions such as headache and flushing of the skin, neurologic disturbances such as vertigo, tinnitus, deafness and paresthesias and hypersensitive reactions such as fever, skin eruptions, and eosinophilia. By far the most significant changes are the eighth nerve disturbances which take the form of tinnitus, vertigo, and deafness, and which may be permanent.

Streptomycin, however, possesses a serious limitation. Strains of organisms initially sensitive to this drug readily develop resistance both *in vitro* and *in vivo* and for this reason it is important to give an adequate dose initially lest the infection becomes drug-resistant before it is eradicated. Another limitation of streptomycin is its reduced effectiveness in the presence of necrotic tissue.[31]

Bacitracin. In May, 1943, while studying the bacterial flora of badly contaminated civilian accidental wounds, Johnson, Anker, and Meleney[38] discovered an organism which produced a powerful antibiotic agent. The organism belongs to the Bacillus subtilis group; the antibiotic is called bacitracin. It possesses activity against gram-positive organisms such as streptococci, pneumococci, staphylococci, micrococci, corynebacteria and clostridia and against two species of gram-negative organisms, gonococci and meningococci. It is ineffective against other gram-negative organisms such as members of the coliform, proteus and pyocyaneus groups. Actinomycetes and spirochetes are susceptible, but fungi are resistant. Laboratory experiments are reported[39] in which bacitracin has been employed with effectiveness as a prophylactic against the development of gas gangrene in the guinea pig.

In general it may be said that organisms sensitive to penicillin are sensitive to bacitracin. However, certain individual strains are penicillin-resistant, but bacitracin-sensitive and vice versa. Some strains initially sensitive to bacitracin subsequently develop resistance, but this tendency is not pronounced. Only one organism has been found which enzymatically inactivates bacitracin.[40] Unlike penicillin, bacitracin is capable of antibacterial activity in the presence of gram-negative organisms. It is not inactivated by the products of tissue breakdown nor destroyed by plasma or blood. There is practically no absorption from the gastrointestinal tract, and hence, if systemic administration is decided upon, it must be parenteral.

Unfortunately bacitracin is moderately nephrotoxic. Patients frequently show albuminuria and evidences of reduced renal function during the course of drug administration.[41] The kidneys of animals given large doses show edema, cellular infiltration, and tubular damage.[42,43] It is as yet impossible to say whether the nephrotoxicity is a quality inherent in the antibiotic or whether it is due to impurity concerned with commercial production. There is evidence which suggests the latter. Despite these manifestations of toxicity, bacitracin in clinically effective amounts has been given for several weeks to a large number of patients without any evidence of permanent renal damage.

The drug has been used systemically in a wide variety of surgical infections with a high percentage of good and excellent results.[41,44] The order of effectiveness is essentially that obtained in comparable infections with penicillin. The type of cases treated have included cellulitis, infected accidental wounds, deep abscesses, osteomyelitis, carbuncles, staphylococcal meningitis and septic abortion. In addition it has been used with encouraging results in the treatment of medical conditions such as human syphilis and pneumonia.

Locally bacitracin has had a wider usage. It is effective in such conditions as pyodermias,[45] ophthalmologic infections and ulcers. It has been applied topically in closed cavities such as empyema and localized abscesses with good results. Local application currently constitutes the safest usage.

The nephrotoxicity of recent commercial lots is of sufficient severity to restrict clinical systemic employment except in infections which have failed to respond to other antibacterial agents or those so severe that the hazard of infection is greater than that of kidney damage.

Polymyxin. In 1947, there appeared independently and almost simultaneously three reports[46-48] concerning the antibacterial activity of material produced by Bacillus polymyxa, a gram-positive spore-forming rod. All strains of this organism do not possess antibiotic-producing activity.[48] Evidence has been presented indicating that several antibiotic substances are produced by Bacillus polymyxa. Polymyxin has been agreed upon as the name to be used and the several currently known polymyxins are designated by letters of the alphabet[49,50] although

formerly the terms "Aerosporin" and "Bacillosporin" were used.

Polymyxin is markedly effective *in vitro* against Salmonella,[51-53] Shigella,[51-53] Klebsiella,[51-53] the Coli-Aerogenes species,[51-53] Pseudomonas,[51-53] Hemophilus influenzae[52-53] and Hemophilus pertussis.[52,53] It is moderately effective against Brucella[51] and certain strains of Staphylococci.[51] Bacillus proteus,[51,53] hemolytic Streptococci,[51] Streptococcus viridans[53] and certain strains of staphylococci[53] are refractory to polymyxin.

Weight for weight polymyxin has the same order of chemotherapeutic activity against gram-negative organisms as has penicillin against gram-positive ones.[46] Polymyxin is bactericidal rather than bacteriostatic.[48,53,54] The rapidity of its action *in vitro* suggests that it is not necessary for the bacteria to be dividing in order to be susceptible to the drug. There is no evidence that species of organisms readily develop resistance to polymyxin.[48,51] When administered orally none of the drug is detected in the blood; therefore, for effective use it must be given parenterally.

The first clinical report on the use of polymyxin was the observation of Swift[55,56] that in early pertussis the disease is aborted dramatically and in the late disease it is significantly modified.

Particularly important from the surgical standpoint is its effectiveness in Pseudomonas aeruginosa infections. Schoenbach, Bryer and Long[57] report excellent clinical and bacteriological results in three cases of infection in children due to this organism, and Pulaski and Rosenberg[51] record its elimination from the urine in urinary tract infections. The latter observers also state that topical application of 1% polymyxin in saline or in carbowax base has resulted in the elimination of Pseudomonas aeruginosa from infected granulating wounds.

Genito-urinary infections due to other gram-negative bacilli are favorably influenced by this drug.[51,56] Pulaski[51] points out that, like other antibiotics, polymyxin is relatively ineffective in cases where there are large calculi, obstruction to drainage, other foci of infection or irreversible changes as found in advanced pyelonephritis with the scarred, contracted kidney and cortical abscesses deficient in blood supply. In these cases the drug may be useful in the control of acute exacerbations or during the preoperative and postoperative periods of patients requiring operation.

Elimination of gram-negative bacilli from the intestinal tract is recorded by some observers,[56] and Pulaski *et al.*[51] state that orally administered polymyxin suppresses coliform organisms in 24 to 72 hours.

The chief limitation of the use of polymyxin rests in its toxicity. Evidences of nephrotoxicity in human beings receiving the drug have been reported by Schoenbach, Bryer and Long[57] and by Pulaski and Rosenberg.[51] The latter observers found that there was no increase in nitrogen retention or evidence of tubular damage when the dose did not exceed 2.5 milligrams per kilogram. Pulaski and his co-workers also observed a high incidence of neurotoxic phenomena associated with polymyxin administration. These consisted of paresthesias and hyperesthesias, mild dizziness and weakness. These symptoms, which were unaccompanied by objective neurologic abnormalities, began with the first dose, but disappeared within 24 hours after completing the course of treatment. Two similar examples of neurotoxicity have been observed in patients receiving polymyxin at the University of Virginia Hospital.

There is belief that the toxicity may be caused by impurities rather than due to the drug *per se*, since, in animal experiments, different lots do not display uniform degrees of toxicity.[51] It is hoped that purification will eliminate the risk of toxicity. If it does, a very potent agent against gram-negative bacilli will be available for general clinical use.

Chloromycetin is an antibiotic which is produced by an organism of the streptomyces group named Streptomyces venezuelae.[58] This organism was isolated independently by Burkholder[59] and by Gottlieb and his colleagues.[60] Chloromycetin has been produced in crystalline form and its structural formula is known. It is a neutral compound and is unique in that it contains both nitrogen and non-ionic chlorine.[59]

Effective doses can be given to human beings without evidence of untoward reactions.[61-67] It can be administered either parenterally or orally and is rapidly absorbed and excreted or inactivated both by man and animals.[61,68]

Chloromycetin has been found effective *in vitro* against the following organisms: Mycobacterium tuberculosis,[59,60,61,69] Staphylococcus aureus,[59-61] Streptococcus pyogenes,[59,60] Streptococcus hemolyticus,[60] Clostridium welchii,[70] Escherichia coli,[59-61] Eberthella typhosa,[60,61] Aerobacter aerogenes,[60] Alcali-

XUM

genes fecalis,[60] Salmonella schottmuelleri,[59-61] Shigella paradysenteriae (sonne),[59-61] Klebsiella pneumoniae,[59,61] Brucella abortus,[59,60] Proteus vulgaris,[60,61] Rickettsia prowazekii,[59,71] Rickettsia orientalis,[71] Rickettsia akari,[71] Rickettsia mooseri,[71] Rickettsia rickettsii (Dermacentroxenus rickettsii).[71]

It possesses considerable therapeutic activity in embryonated eggs and in mice infected with viruses of psittacosis or lymphogranuloma venereum.[72] Experiments[70] in which chloromycetin has been used as a prophylactic agent against Clostridium welchii infection in guinea pigs have yielded results which are encouraging.

In vitro studies reveal that chloromycetin is not active against certain protozoa,[61] certain yeast and filamentous fungi,[61] and Pseudomonas aeruginosa.[60] It is also ineffective in experimental avian malaria, experimental rabbit syphilis and it offers no protection against Type A influenza, St. Louis encephalitis, and fixed rabies virus infections in mice or in eggs.[61]

Favorable reports concerning the clinical use of chloromycetin in typhus fever,[63,66] scrub typhus,[62] Rocky Mountain spotted fever,[64] typhoid fever,[65] bacillary urinary infections,[67] and brucellosis[73] have been reported.

From the surgical standpoint the report of chief interest is that of Chittenden *et al.*,[67] who treated 50 cases of urinary tract infection with chloromycetin. The causative organisms were chiefly gram-negative bacilli, although there were a number of mixed infections in which gram-positive cocci were a component of the bacterial flora. When the latter group of organisms was present penicillin or sulfonamides or both were used with chloromycetin. Among the 50 cases 38% of the infections were controlled, 44% improved and 18% showed no improvement. Twenty-seven cases were treated with chloromycetin alone. In 10 the infection was controlled, in 11 improved while 6 were unimproved.

Perhaps the most striking feature of chloromycetin is its antirickettsial action; this has temporarily over-shadowed its other possible usages. However, close inspection of the antibacterial spectrum of this drug suggests that it may be of value in other conditions, among which are certain surgical infections caused by chloromycetin sensitive organisms.

Aureomycin. The antibacterial properties of a strain of streptomyces was first described by Duggar,[74] who gave the organism the name streptomyces aureofáciens because of the yellow pigment it produced. This antibiotic has been prepared in yellow crystalline form and is called aureomycin.

In vitro studies have demonstrated that aureomycin is effective against a large number of microorganisms which produce disease in man. Among these are (1) the following gram-negative organisms: Escherichia coli,[74-77] Aerobacter aerogenes,[74-77] Klebsiella pneumoniae,[74-76] Neisseria gonorrhoeae,[76] Neisseria meningitidis,[76] Eberthella typhosa,[74-75] Brucella abortus,[74] Hemophilus influenza,[75-76] Salmonella, sp.,[76] and (2) the following gram-positive organisms: Streptococcus pyogenes,[74,76] Streptococcus faecalis,[76,77] Staphylococcus aureus,[74,76] Staphyloccus albus,[76] Bacillus subtilis,[74] and Diplococcus pneumoniae.[76] Mycobacterium tuberculosis[74] is also sensitive. This drug possesses marked therapeutic activity against the viruses of the psittacosis—lymphogranuloma group and rickettsiae of the spotted fever, typhus fever, scrub typhus fever and Q fever groups in embryonated hens' eggs, mice and guinea pigs.[78] Preliminary experiments in which it has been used as a prophylactic against the development of gas gangrene in the guinea pig have yielded promising results.[70] Pseudomonas aeruginosa[74-77] and Proteus vulgaris[75-77] are aureomycin-resistant.

Aureomycin is bacteriostatic rather than bactericidal in its action.[75] It was found to be less effective *in vitro* than penicillin,[75-76] but more so than streptomycin in inhibiting gram-positive cocci and it is less effective than polymyxin[75] and about equally as effective as streptomycin against most gram-negative bacilli.[76]

Paine, Collins and Finland[76] found that while some of the bacteria studied develop resistance *in vitro* to aureomycin, most do not readily do so. Clinical observations to date seem to bear this out.[76] No evidence has been found of any aureomycin-inhibiting substance similar to penicillinase.[76]

The only untoward manifestations which have been attributed to the drug have been nausea,[77,79,80] vomiting,[79] loose bowel movements,[81] and diarrhea.[77]

Wright *et al.*[82] report 52 unselected cases of acute peritonitis, 35 of which were due to appendicitis, 16 to perforated gastric and duodenal ulcer and one to perforated sigmoid diverticulum. Aureomycin was used as the chemotherapeutic adjunct to well recognized surgical management for cases of these types. All patients except one with appendicitis were operated upon. The mortality rate for peritonitis due

XUM

to appendicitis was 5.71%; for that due to perforated ulcer, 12.5%.

Infections of the urinary tract due to aureomycin-sensitive gram-negative bacilli respond favorably to therapy with this drug[77,80,81] and are comparable to the results obtained with the use of sulfonamides or streptomycin in similar cases.[81] In some instances aureomycin has been effective after failure with sulfonamide, penicillin or streptomycin therapy.[80]

The above mentioned are the only conditions of primary surgical interest for which the use of aureomycin has been reported. However, there are numerous reports concerning the application of this drug in other clinical fields. Gonococcic urethritis,[81] pneumococcus pneumonia,[81] atypical pneumonia,[79] the ulcerative lesions of patients with proven lymphogranuloma inguinale,[83] Q fever,[84] Rocky Mountain spotted fever,[80] tularemia,[85] brucellosis,[80] typhoid fever,[80] staphylococcus skin and breast abscesses in infants,[80] lymphogranuloma venereum,[83,86] and miscellaneous ocular infections,[87] all in small numbers of cases have shown favorable response to aureomycin therapy.

These reports suggest that aureomycin may be useful in a large variety of bacterial diseases as well as infections with rickettsiae or with viruses of the psittocosis-lymphogranuloma venereum group.

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XUM

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DISCUSSION

DR. EDMUND HORGAN, Winchester: Chemotherapeutic agents date back to the introduction of salvarsan in 1909 by Ehrlich; bacteriostatic substances to studies of prontosil in 1935 by Domagk; and antibiotics to the discovery of penicillin in 1929 by Fleming. With the introduction of the antibiotic substance penicillin, a new era in the treatment of surgical infections was opened to us.

One of the greatest faculties of man is vision—vision to formulate a concept. Scientists had previously observed that in the presence of contaminating molds cultured bacteria would not grow around the contaminants. Soil bacteria and molds which would inhibit or destroy pathogenic bacteria had been studied. But it was Fleming who not only observed that certain molds which contaminated his cultures prevented the growth of bacteria around them, but who conceived the idea that the product of these molds could be used to prevent infection and to destroy infectious organisms causing infectious diseases in man. With this concept fully formulated and the purification of penicillin by Florey and his associates at Oxford, investigations were carried out on animals and later on patients. Florey's problem was to purify this protective substance which the molds produced—this substance which the molds produced to protect themselves from being destroyed by bacteria. Florey and his associates succeeded in purifying it, and at a critical time, when Great Britain was at war and had many battle casualties. So confident was Sir Alexander Fleming that penicillin would kill organisms causing infection in man that he had it used in the case of a friend who was suffering from streptococcal meningitis where other forms of treatment had failed. Its intrathecal administration to this patient resulted in a cure. This was one of the early cases on which it was tried, and the first time it was given intrathecally.

With the production of penicillin by Florey and his co-workers, it became an urgent necessity to produce the substance in quantity. For this the ingenuity of the industrial engineers of the United States was challenged. They accepted the challenge, and within a few months production of penicillin was on its way.

The sulfa compounds had been studied so extensively since Domagk's experimental studies of prontosil that about the time we had penicillin we also had sulfanilamide, sulfathiazole, sulfaguanidine, and sulfasuxidine. The United States had then become engaged in World War II. In the late summer of 1943, all of these substances were available in the military hospitals of the United States. Guided by the results of clinical studies made for the National Research Council, and under the direction of able civilian consultants, antibiotic and bacteriostatic substances were used singly and in combination with striking results. Since that time other substances had been developed, and others are being searched for.

With the availability of these substances, there should be an understanding of their usefulness. Experimental laboratory studies and well supervised clinical investigations have supplied us with much useful information, and it is the careful application of this knowledge which Dr. Sandusky has stressed that we follow in the use of these valuable substances. Their use has been of inestimable value to surgical patients. But, as Dr. Sandusky has also pointed out, their use is of greatest value when other surgical principles are followed, such as the treatment of shock, the replacement of blood during surgical operations, the carrying out of nutritional and supportive therapy before and after surgical operations, meticulous hemostasis, and carefully executed surgical procedures.

Antibiotic and bacteriostatic substances have brought about new surgical conditions with which the surgeon is confronted. Among these may be mentioned re-establishment of the gastro-intestinal tract with closure of enterostomies and colostomies in cases where the patients have been saved from death from polybacterial peritonitis; decortication of the lung in cases of fibrinous pleuritis following traumatic hemothorax where infection was prevented; extensive decortication of the lung in cases of chronic empyema following suppurative pleuritis which have been treated too long by the use of these substances and where drainage has been delayed; reconstructive surgical procedures necessitated by inexcusably prolonged suppurating osteomyelitis; and, many others.

With the aid of these antibiotic and bacteriostatic substances the morbidity and mortality following contaminated wounds was much lower in World War II than in any previous war. Their use in civilian practice has been just as effectual. However, as Dr. Sandusky cautioned, let us use these substances when indicated, but do not neglect to carry out sound, well-established surgical principles in the management of contaminated wounds in surgical infections.

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Medical Society of Virginia Cancer Committee

Chairman, GEORGE COOPER, JR., M. D.

Medical School Building, University, Virginia

Reprints of this and preceeding Bulletins may be obtained from this office

October, 1950

Case Reports

A 50 year old woman, who had been aware of progressive weakness and indigestion for about six months, had a profuse gastric hemorrhage. At exploratory laparotomy, a bulky tumor was found, arising in the upper portion of the stomach and attached to adjoining structures. Many of the regional lymph nodes were enlarged. The surgeon decided that the patient had an inoperable carcinoma of the stomach and closed the abdomen. Three months later, she was referred to a Tumor Clinic because of persistent gastric bleeding.

On admission, multiple abdominal masses were readily palpated. Also, the inguinal and femoral nodes were tremendously enlarged, and the axillary nodes were moderately enlarged. An inguinal node was removed for pathological study. The report was not carcinoma, but lymphosarcoma.

The tumor yielded in a dramatic fashion to x-ray therapy. Within a week, the abdominal masses, the inguinal and the femoral nodes were no longer palpable. The axillary nodes, though they had received no direct radiation, were greatly reduced in size. But the brisk gastric bleeding continued. In spite of almost continuous transfusions and in spite of the regression of the tumor, the patient remained so exsanguinated throughout her hospital stay that surgical intervention was considered impractical. On the twelfth hospital day, she died.

At post mortem examination, a huge gastric ulcer measuring 8 cm. in diameter was found high on the lesser curvature. The ulcer eroded the pancreas and in its center was a large open artery, the pancreatoduodenal. The body was completely exsanguinated. There were no tumor cells in those regions that had been radiated, not even in the margin of the ulcer. A few axillary and mediastinal nodes contained tumor.

Comment: 1. To quote from a standard textbook, Pack and Livingston's "Treatment of Cancer and Allied Diseases," "lymphosarcoma (primary in the gastrointestinal tract) may be treated successfully with a reasonable hope of cure by either external radiation or surgical extirpation. If one encountered a resectable tumor suspected of being a lymphosarcoma, it would demand more than courage merely to take a biopsy specimen and close the abdomen. However, if a frozen-section biopsy definitely classified the tumor as lymphosarcoma, one may expect an almost miraculous result from external radiation therapy alone. Not only are gastro-intestinal x-ray studies found normal, but *the patient may live for many years free of disease. The routine recovery of a biopsy specimen from every inoperable gastric tumor is therefore imperative* on the chance that it may be a primary lymphosarcoma and therefore amenable to x-ray therapy."

2. At the abdominal exploration,

(a) a biopsy should have been taken,

(b) the stomach should have been opened in an effort to find the bleeding point. As it turned out, the bleeding could easily have been stopped. The patient died, not of tumor, but of hemorrhage.

3. The response of the tumor to x-ray therapy indicated that, had the bleeding been controlled, radiation would have given her at least a few, and probably many years of normal life.

4. However, if the patient had stopped bleeding, she would not have been referred to the Tumor Clinic. Since no biopsy had been obtained, she would soon have died at home of untreated lymphosarcoma of the stomach. On the death certificate, the cause of death would have been noted as carcinoma of the stomach.

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PSYCHIATRIC IMPLICATIONS IN GEREOLOGY*

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and
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In any discussion of the relation of psychiatry to geriatrics it would seem pertinent to point out first the sociological significance of increasing old age, which has a distinct bearing on the psychiatric management of those elderly people who become mentally ill.

It is a well known fact that there is a gradual increase in the proportion of the population who are over the age of sixty-five. In a statement made recently by an official of the Department of Labor it was stated that in 1900 one in every twenty-five living persons was sixty-five years of age or over; now it is approximately one in thirteen. In the year 2000 it is estimated that it will increase to one in eight. That official also pointed out that the paradoxical situation had arisen in that, although the proportion of the population living past the age of sixty-five was increasing, the relative number of employed individuals was decreasing; whereas in 1890 seventy per cent of the men over sixty-five were employed, in 1940 only forty-three per cent were employed.

The sociological and economic factors involved in the increasing longevity are becoming apparent. Federal and State governments are either sincerely or for matters of political expediency, or both, accepting the financial responsibility for the care of the aged with expanding old age pensions. Industry is reluctantly, but probably more efficiently, being pushed into the role of assuming along with labor unions the responsibility of creating welfare and retirement funds, thus assuming financial responsibility for the employee past the age of normal productivity. The individual is also becoming more acutely aware of the increasing number of years that he is expected to live following his retirement age and he is therefore attempting to correlate his insurance, retirement pay, and pensions so as to afford him the maximum financial security.

What will this mean from a medical standpoint? It will mean that probably by the year 2000 one-eighth of the patients seen by the physician will be over the age of sixty-five. This patient will no longer be productive or will have only a few years of productivity left, and he will be living on a fixed income. In addition to the usual medical illnesses there will be a gradual increase in the incidence of diseases concurrent with advancing years such as cardio-vascular and renal diseases, arthritis, malignancies, and organic mental illnesses. These illnesses are normally chronic, but tend to become more so in elderly people. It means that the general practitioner along with other specialists will need to be well versed in the field of geriatrics. Geriatrics is not a special field of medicine *per se*, but is an important part of the adult specialities. Because of the fact that most of these people will be living on a fixed income, and a large number will have chronic illnesses, it becomes apparent that increasing numbers of patients will require permanent institutionalization or hospitalization. The commitment will be in numbers larger than those due merely to a larger population because of the increasing proportion of the population over sixty-five.

In addition to the occupational and economic factors, there are certain psychological influences affecting the problem of old age. The most important of these is the effect that old age has on individual security. The feeling of security is paramount in a normally well-integrated personality. In most instances the family group affords the greatest sense of individual and collective security. As old age advances the security afforded by an intact parent-child relationship changes. It changes from one in which the older individual relinquishes his independent and dominant role and assumes a secondary, more or less dependent one. The evolution of the change from independence to dependence is a normal process in the life cycle of any individual. How gracefully and successfully it is accomplished depends upon how well the individual personality is integrated. It corresponds to a similar psychological adjustment that is experienced in the adolescent and involutional periods. Normally the personality

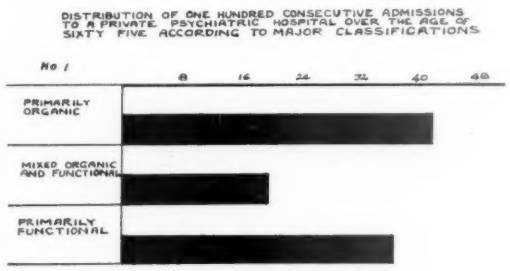
*Read before the annual meeting of the Medical Society of Virginia at Fort Monroe, October 9-12, 1949.

in advancing years becomes progressively inelastic. This means that the individual characteristics in modes of living, thinking, feeling and working have become relatively fixed. Forced changes are difficult to accept and adjustments are difficult to make.

The place of psychiatry in the problem of geriatrics is a rather broad one. From a preventive standpoint it can help by teaching family groups to accept the normal philosophy of the evolution of old age. It can help the more independent members of the family group to formulate plans of care which will not accentuate the growing feeling of dependency. It can advise the family in an objective way in matters of hospital care where the picture is confused by undue emotionality. Psychiatrists can treat a large number of the functional illnesses of advancing years successfully, and they can return these individuals in a relatively normal state to their original and often times improved environment. The psychiatrist must correlate his management of the patient with the sociological factors involved and keep as his purpose the formulation of a plan of treatment which will minimize the length of hospital care to a group whose illnesses tend to chronicity. He should try to protect their ability to live on a fixed income, to restore productivity where practical and to help the individual assume a happier, better adjusted mode of living.

The classification of psychiatric disorders occurring in the age group over sixty-five obviously shows a rather noticeable increase in the incidence of psychoses due to organic changes. Disabling functional illnesses are comparatively rare, except for the affective disorders. The problem of schizophrenia is rarely encountered because this is a disease of early life and the schizophrenic has long since either made a modified adjustment to his community or has been permanently institutionalized. The psychoneurotic individuals with the exception of the reactive depressive group are for the most part either fixed neurotic invalids or have learned to accept their compensating disabilities. The behavioral and emotional problems arising from the attempt of a developing personality to adjust to normal living are in the past. However, the emotional disturbances precipitated by the attempt of the inelastic adult personalities to adjust to old age are still present. Although there are certain exceptions, for practical purposes the chief psychiatric disorders arising after the age of sixty-five are mainly functional in the form of affective disturbances or those resulting from organic changes or a combination of both.

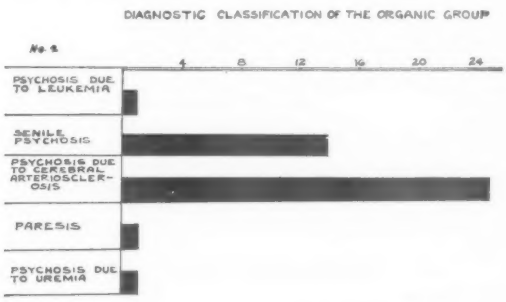
As a background for this paper, a review was made of one hundred consecutive admissions to a private psychiatric hospital of individuals over the age of sixty-five. The cases were divided (fig. 1)

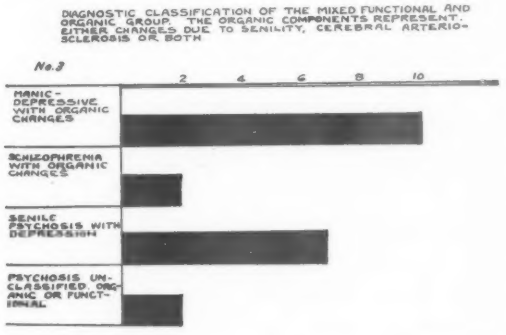


into three broad classification groups: (1) primarily organic, (2) mixed organic and functional, and (3) primarily functional. Surprisingly, fifty-eight per cent exhibited either a mixed organic-functional picture or were entirely functional. This fact is quite significant in relation to treatment. Twenty or more years ago there was a tendency to diagnose all elderly psychotic individuals as having an organic type of psychosis. From a treatment standpoint there was no real reason to make a careful differentiation. With the advent of electric shock treatment there immediately became a need for a careful delineation between organic and functional illnesses since it was found that functional illnesses, particularly of the affective group, responded well to electric shock therapy. There was at first considerable hesitancy to administer electric shock treatment to patients over the age of fifty or fifty-five or to those patients showing any degree of organic changes. During the past few years, however, with a more careful differentiation between organic and functional illnesses, and with a more aggressive, but selective use of electric shock treatment, we feel that we have something definite in the way of psychiatric therapy to offer this particular group.

Of the organic group the senile psychoses and psychosis due to cerebral arteriosclerosis (fig. 2) form the largest components. As is well known the separation between these two types of organic psychoses is often confusing and frequently both types of pathological changes are present. For the purpose of this paper the diagnoses as set forth on the

patient's chart were used; however, unquestionably in some instances there was a mixed organic picture. Paresis as a primary clinical picture is relatively rare after the age of sixty-five, particularly in the private hospital. Usually these cases are discovered much sooner, are treated, and if they remain psychotic are permanently institutionalized. The relative frequency of the functional types in the mixed organic-functional group is shown in figure 3. In the schizophrenic and manic-depressive groups it was felt that the diagnosis was primarily functional, but there was sufficient evidence of organic changes to warrant an inclusion of the prevailing organic factor. The two schizophrenics exhibited a long-standing picture of personality changes which antedated their organic changes.




DIAGNOSTIC CLASSIFICATION OF THE MIXED FUNCTIONAL AND ORGANIC GROUP. THE ORGANIC COMPONENTS REPRESENT EITHER CHANGES DUE TO SENILITY, CEREBRAL ARTERIOSCLEROSIS OR BOTH
No. 3
2
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MANIC-DEPRESSIVE WITH ORGANIC CHANGES
SCHIZOPHRENIA WITH ORGANIC CHANGES
SENILE PSYCHOSIS WITH DEPRESSION
PSYCHOSIS UNCLASSIFIED ORGANIC OR FUNCTIONAL

The clinical differentiation between an organic and functional psychosis after the age of sixty-five is difficult. A careful history from the family will frequently disclose evidences of previous periods of elation or depression. Elderly people accept changes very poorly. Frequently they are shifted about or placed in a new home when their spouses die, creating reactive situations. Functional disturbances as a rule are more sudden and can usually be found to originate in some change in the environment. Sensorium and memory defects are, of course, quite pathognomonic of organic changes, but frequently such patients are highly over-active or mute and cannot be adequately tested. If they are accessible there are certain psychological tests which are quite helpful. The routine neurological, physical and laboratory studies will help demonstrate the presence of arteriosclerosis or other organic changes and will help to evaluate the patient as a whole. However, the mere presence of clinical arteriosclerosis will prove misleading if this is depended upon solely in establishing the criteria for treatment.

The problem of differentiating between the two groups can well be illustrated by two cases. The first case was a sixty-six year old man who four years prior to admission to our hospital was admitted for observation to another psychiatric hospital where a diagnosis was made of cerebral arteriosclerosis with anxiety state. In reviewing the patient's history it was learned that he had been forced to make a change in his working conditions, and it was felt that this precipitated his episode at that time. The patient spontaneously improved and was released from the hospital after a few days. He returned home and worked satisfactorily for the next four years. Then suddenly during the warm summer months he became agitated and depressed. At the time of admission he was quite depressed, and he was considered potentially suicidal. This period of depression, however, quickly changed to one of elation during which he exhibited a rather typical manic episode. He became violent, was a difficult management problem, and manifested physical exhaustion. Clinically he had some arteriosclerotic changes. However, in view of his history of difficulty four years previously from which he apparently recovered, of absence of sensorium defects during the interval, and of his second attack characterized initially by depression followed by a typical manic episode, it was decided that electric shock treatment would be indicated. It was felt that, although there were some beginning organic changes, the illness in itself was primarily an affectual disturbance. His response to electric shock treatment was good and he has been employed for a year after he was discharged from the hospital.

The second case was that of a woman who was first admitted to our hospital about six years ago at the age of sixty-two. Her illness at that time was

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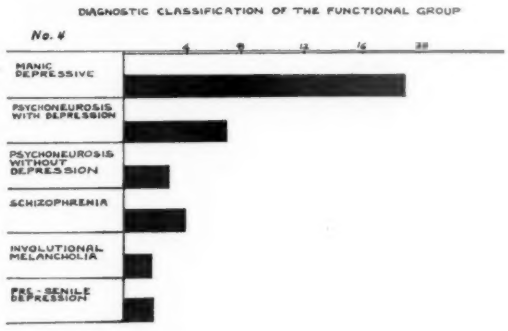
characterized by a sudden onset of right side weakness which subsided in a short time, followed by depression and hallucinations. A diagnosis of psychosis due to cerebral arteriosclerosis was made, and it was believed that she initially had had some type of cerebral accident. In reviewing the history it was noted that she had had a similar episode several years previously and that her second episode followed some domestic difficulty. It is also noted that at the time this patient was originally seen the use of electric shock treatment in elderly people was quite in its infancy. The patient remained in our hospital about one month and made no real improvement. She was removed from the hospital and taken home and subsequently re-admitted to another psychiatric hospital where electric shock treatment was administered. Following electric shock treatment, according to the family, the patient recovered entirely and remained well until recently when she again became mute and depressed. She was readmitted to our hospital and in spite of the history and evidence of clinical arteriosclerosis it was felt that she had primarily a functional disorder. Accordingly, she was again given electric shock treatments and a remission was obtained. In retrospect, it was apparent that hers was an acute episode of a functional nature with the picture confused by history of right side weakness and generalized arteriosclerosis.

The correct evaluation of organic and functional symptoms has a great deal of influence on the family's decision as to disposition of such cases. Frequently elderly people are brought to the hospital merely "to see if anything can be done". By this they are actually meaning, is this a functional or an organic illness? The responsibility of the psychiatrist is obviously rather great. As the two cases above illustrate, it is quite easy to make a mistake in diagnosis and it might be rather embarrassing if one were to tell the family that the patient would in all probability become progressively worse and in a few months spontaneous improvement occurred. Generally, it would be better to err on the side of conservatism. A change in environment, psychotherapy in the form of reassurance, correction of dietary deficiences, and subshock doses of insulin, often produce a gradual improvement over a sufficient period of time. However, in a private hospital one is usually limited by financial considerations. Frequently these patients are either excited, violent, depressed, agitated or suicidal. Some will eventually exhaust themselves physically, others are mute and require forced feedings. If electric shock treatment can be used early in the treatment program many dangers concurrent with disturbed patients will be eliminated. Electric shock treatment in the older age group becomes increasingly hazardous; consequently, the decision the psychiatrist must make is often quite delicate and quite important.

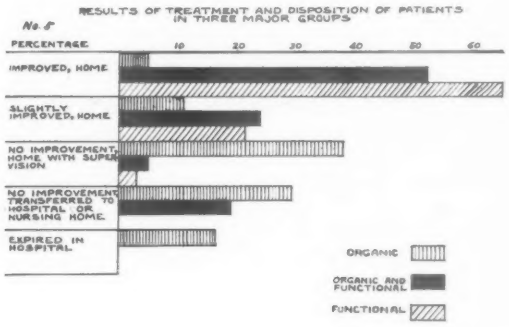
In the group presenting primarily a functional picture (fig. 4) the diagnosis is usually not too difficult.



Fortunately the largest number falls in the affective group. Among the cases studied, it was found that of a total of thirty-seven in the functional group, nineteen were diagnosed as manic-depressive, and, of the remainder, eleven had definite affectual disturbances, usually depression. These cases reviewed included some admitted in 1945 and 1946. In all probability more of the functional illnesses of this group would have been treated by electric shock treatment if admitted at the present time. The minimum age of sixty-five was chosen to eliminate the involutional psychoses; however, two in this group were diagnosed as such.

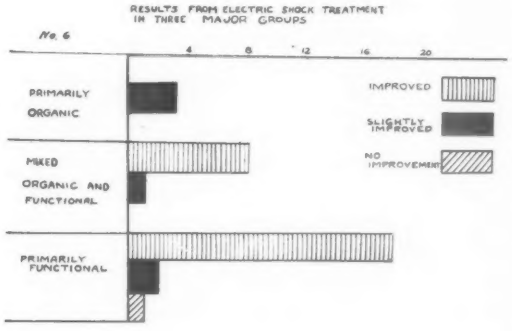
The results of the various types of treatment were evaluated as a group (fig. 5). This included those treated conservatively and by electric shock treatment. No special follow-up studies were made other than to correlate the treating psychiatrist's summary with reports of his routine follow-up studies. Patients included in the improved group were those able to return home and resume their normal status. Those classified as slightly improved were those who were well enough to be discharged, but still clinically ill. Four of the patients listed as improved required a second or more series of electric shock

treatment for a relapse of affective disturbances after a period of several months had elapsed. The fact that nearly five per cent of the primarily organic group were reported as improved may mean that the affective component of the illness was overlooked or the change of environment or reassurance played an



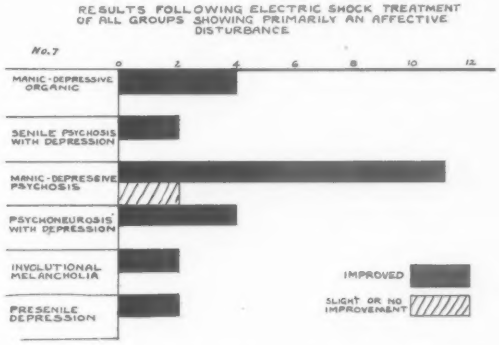
important role. The prognosis is quite clearly in favor of the functional group and decreases with the presence of true organic symptoms.

The results from electric shock treatment are shown (fig. 6.). A total of thirty-three per cent of the patients received electric shock treatment. There were no fatalities or serious complications. Twenty-six of the thirty-three patients receiving electric shock treatment were considered improved suffi-



ciently to return home and assume their normal positions. The results in those patients showing primarily an affective disorder, either alone or in conjunction with organic changes, responded about equally well to electric shock treatment (fig. 7). Twenty-five of the twenty-seven treated were listed as improved. The results in those patients having primarily an affective disorder were not a great deal different from those expected in the treatment of the affective disturbances of a younger age group. As a rule electric shock treatment was given more slowly, a fewer treatments were required, and the so-called "shock confusion" appeared sooner and lasted longer in the older patients.

The picture in relation to the progressively deteriorating organic psychoses is quite a different matter. Approximately seventeen per cent of the or-



ganic group expired within a short time after admission. Of the forty-two diagnosed as primarily organic, only two were listed as being sufficiently improved to return home and assume their normal status.

SUMMARY

In this paper we have attempted to point out the significance of the fact that, because of increased longevity, there will be advancing sociological problems which will have to be correlated with the practice of medicine. As a method of emphasizing the importance of this problem in relation to psychiatry, one hundred consecutive admissions to a psychiatric hospital were reviewed from a diagnostic and treatment standpoint. As a result of this study it appeared that, while the problem of primarily organic psychoses remains relatively unsolved, psychiatry can be of distinct benefit to those patients showing an affective disorder with or without associated organic changes.

St. Albans Sanatorium.

DISCUSSION

DR. THOMAS N. SPESSARD, Norfolk: I certainly enjoyed Dr. King's paper. He presented in a very masterful way the problems with which we have to deal in the elderly type of individual, in whom very frequently the question of whether the disease is worse than the treatment risk has to be decided. The problems in the group over sixty-five are such that thoughtful judgment is re-

quired, as well as evaluation of end results. In my experience, as in Dr. King's, so many of these patients do have mixed disorders, organic as well as functional, so we have to evaluate both the organic and the functional factors as to their importance in the disability.

The results Dr. King has gotten with the shock type of therapy are certainly very gratifying. I do not know of anyone who has gotten better results in this type of individual. I certainly enjoyed his paper very much.

DR. WALTER O. KLINGMAN, Charlottesville: I should like to ask Dr. King if aside from his shock therapy any particular emphasis was placed on the period following shock, in which these patients were stimulated to assume some type of activity or a role in the family unit or in the community, or stimulating them to other interests beyond the purely therapeutic measure of shock treatment. It has been our experience that, when this is introduced, if you can use the so-called all-out push program these individuals need a new environment, either in an institution or some domiciliary, and they will do very much better than if they are given shock treatment and returned to the same environment. Of course, in the so-called neurotic patients, who have had repeated difficulties through life, the aging process is another factor in the case. That problem is of another nature. But in our experience we have found that adjuvant treatment beyond the shock treatment is very helpful. I wonder if that was also taken into consideration in estimating the results here that Dr. King has reported.

DR. KING, closing the discussion: I would like to thank Drs. Spessard and Klingman for their discussion of this paper.

The reported patients all received the benefit of some push therapy; in addition, nursing care, reassurance, improved diet, change of environment, etc., were definite contributing factors in their improvement, when improvement was made. In the affective disorders, however, the sudden dramatic change in those receiving electro-shock therapy was, in our opinion, largely attributable to this specific treatment.

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MARINELLO, GIOVANNI: Le medicine partenenti alle infermita delledonne. Divise in tre libri: Nel primo de'quali si curano alcuni difetti, che possono sciogliere il legame del matrimonio: nel secondo si rimove la sterilita: et nel terzo si scrive la vita della donna gravida, fino che sia scita del parto, con l'ufficio della levatrice. Venice, F.de Franeschi Senese, 1563. 80., 258 1. 5 1. 14.7 cm.

——: Les maladies des femmes et remèdes d'ycelles. . . . Paris, I. Berjon, 1609. 863 p. 17¼ cm. translated by Jean Liebaut. (ML)

Neither Siebold nor Baas mention this Italian. Bayle has a brief note describing him as a XVI century Italian physician who translated into Latin the works Hippocrates, and who was the author of a treatise on fevers and also one on the plague. One of his translators speaks of him as a physician of Formia, but usually he is called a Venetian.

His "Le Medicine partenenti alle infermita della donne" was translated into Latin by a French physician, Jean Liebaut. This passed for a while as an original work. When later it was translated into French the original authorship was acknowledged. The French edition has a full page illustration of a cesarean section.

XUM

THE DIAGNOSIS AND TREATMENT OF RUPTURED CERVICAL DISK*

James L. Thomson, M.D.,
Norfolk, Virginia.

Since the memorable work on ruptured intervertebral disk by Barr and Mixter in the early thirties innumerable articles have been published, and the syndrome taught in medical schools and clinics until today a ruptured lumbar disk syndrome is almost as clearly understood by the average doctor as is the diagnosis of pneumonia. Such is not the case, however, when dealing with neck and upper extremity pain. Indeed, this subject is only now becoming popular and the American literature contains only scattered excellent accounts of this painful condition. Older isolated records of recognized disk lesions in this region were by Stookey in 1928, Dandy in 1928, and Elsberg in 1931, all referring to it as a chondroma, causing cord compression rather than nerve root irritation. The clinico-pathologic subject was first clarified by Semmes and Murphy in 1943, with further useful articles appearing by Spurling and Scoville, Ulmer and Meredith, and Kristoff and Odom. Keegan has been interested in the isolated segmental and dermatome distribution of both the upper and lower extremity. He has mapped out sensory changes in hundreds of single nerve root compressions and recently revised the old dermatome outlines advocated by Sherrington, Head, Foerster and others, that were taught in neuro-anatomy and neurology courses for years. Keegan's description certainly makes for accurate localization of nerve root compression when surgery is done for relief of upper or lower extremity pain. These dermatome descriptions will be alluded to later in the discussion of the symptom complex of the ruptured cervical disk. A ruptured cervical disk is much less common than one in the lumbar region. However, they are so frequent that the average industrial surgeon or neurosurgeon will usually have one or more such cases under treatment most of the time. The symptoms may be acute or chronic in nature, and may require operative or conservative treatment just as the lumbar disks do. Also, they may at times require more precise neurologic knowledge for diagnosis, and more finesse for surgery than the lumbar disk.

Some peculiarities of the cervical spine and cord relationship cause even the smaller protruded disks to cause potential serious and sometimes permanent damage to the neural structures. The lower portion of the cervical spine is more mobile than the upper which accounts for the usual disk being found at C. $_5$ or C. $_6$ interspace. The spinal cord occupies the entire spinal canal at this level and compression on the cord isn't counteracted by displacement as it is lower in the canal. The nerve roots leave the cord at right angles and makes a quick short exit through the intervertebral foramen, rather than at an elongated downward angle in the lumbar region free of cord substance. Since the first cervical root emerges above the first cervical vertebra there are eight pairs of cervical nerves, seven emerging through the seven intervertebral foramina. Consequently, the sixth cervical root leaves through the fifth intervertebral foramen and the seventh root through the sixth foramen, etc.

The intervertebral foramina are vertically elongated and narrow from side to side. This makes for signs of root irritation when even a small disk is displaced pushing the nerve root against the bony edges. Osteophytes often extend into the foramen, further narrowing it and at times compressing the nerve root. The ligamentum flavum is much thinner here, generally 3 to 5 m.m., and it is almost completely covered by the adjacent laminae excepting closest to the spinous processes. Just as the fourth and fifth lumbar vertebra are at the level of the greatest stress in the lower spine impinging on the fifth lumbar and first sacral roots, so the fifth and sixth cervical vertebra are the common sites for ruptured cervical disks, pressing on the sixth and seventh cervical roots. Consequently, peripheral distress of pain and sensory changes in a C. $_6$ root lesion are felt along the outer side of the arm and radial side of the forearm with greatest numbness being in the thumb and forefinger. At C. $_7$, root involvement would be along the lateral side of the arm, dorsal surface of the forearm with numbness of the three middle fingers, usually worse in the forefinger. The less common C.$_8$ root pain is felt along the ulnar side of the forearm and outer two fingers.

*Read before the annual meeting of the Medical Society of Virginia at Fort Monroe, October 9-12, 1949.

XUM

Careful history and neurologic examination will usually suffice to make an accurate diagnosis and localization of a ruptured cervical disk. With or without a history of injury the patient generally, complains of a crick in the neck to a severe wryneck pain at the onset. This may be the only symptom for several days to weeks. Then, with extension of the pain, it usually radiates into the back of the head, into the interscapular space, onto the shoulder, about the upper chest anteriorly and posteriorly and then down the upper extremity to the hand, as described in the sixth and seventh cervical dermatome distribution. The pain may become agonizing in its severity so that moving the neck may send lightning shocks along the entire extremity. For this reason muscle spasm causes the patient to hold the neck quite still. X-ray will show a straight cervical spine without lordosis. Many patients find it impossible to stay in bed more than two or three hours at a time without seeking another position to relieve pain. As the lesion progresses, weakness, fibrillation and atrophy of the smaller muscles become evident. Objective muscular weakness is hard to demonstrate in the usual case, but when present helps to localize the level of the ruptured disk. The biceps is supplied by C. $_5$ and C. $_6$ root, and is expected to be involved in a C. $_5$ interspace lesion. This reflex will be diminished. If the triceps muscle is weak a lesion is expected at C. $_6$ interspace and this reflex will be diminished.

When weakness and atrophy have progressed to any degree, some permanent disability will usually follow.

Patients can tolerate the discomfort of numbness and rarely will a person be willing to submit to operation for this symptom alone. In my experience the precise localization of numbness in the hand is of greater localizing value than the description of the pain. The latter may be present for sometime before the onset of numbness. Numbness may be only subjective and when tested objectively no sensory changes can be demonstrated. Raising the intraspinal pressure as when coughing, straining at stool or sneezing will often markedly exaggerate both pain and numbness. A typical lightning electric shock like sensation courses though the extremity in the involved dermatome. One of the most useful aids utilized in reproducing the pain is with the patient in the sitting position, to bend the neck toward the affected side and the examiner makes downward pressure from the top of the head. This maneuver further narrows the interspace making more pressure on the involved nerve root. Some writers consider this neck compression test almost pathognomonic.

Some clinics routinely perform lumbar punctures and do a contrast media study before operating on a cervical disk. Most operators prefer to be guided by the clinical findings in lieu of the pantopaque test because of the difficulty of obtaining satisfactory x-ray films in the cervical region. This is because the oil placed in the lumbar canal breaks into globules in the cervical region and becomes streaked, lacking localizing value. Also, oil that is allowed to break up is quite difficult to remove at the conclusion of the test. Symptomatic arachnoiditis may follow.

Treatment for this lesion is either conservative or operative depending on the individual case. The chronic pain or subacute one should have bed rest for some time, using neck or skeletal traction as indicated. If the symptoms subside, a collar may be worn for some time to afford comfort. Physiotherapy in the form of diathermy and hot packs is helpful. It is dangerous to manipulate the neck as the segmental pain may be converted into cord compression by massive herniation of the herniated nucleus with resulting severe cord damage.

Operative treatment is desirable in the acute case which is not relieved by a few days bed rest. The pain appears to be more agonizing than the ruptured lumbar disk case, and the patient is anxious for the operative relief. Generally under local or intratracheal anesthesia a midline straight incision is centered over the involved spinous process and a partial hemilaminectomy of the involved interspace region is performed. The nerve is found displaced posteriorly and usually stretched quite tight over the protruded disk. The disk may be soft, in which case the nerve root can be displaced gently and the fibroelastic nucleus material removed. On the other hand, if the protrusion of the disk is hard, cartilaginous, or osseous, damage may be done to the nerve in trying to displace it. In this type of case it is best at times to disregard the protrusion and make a wide bony decompression for the nerve by removing the posterior border of the facet. This maneuver will often prevent irreparable damage to the nerve root with resulting partial paralysis of the hand. Ordi-

narily pain is relieved satisfactorily by this type of operative procedure.

No cast is necessary and the convalescent period is shorter than in the lumbar disk cases if the patient is a laborer. It appears safe for him to resume full work in three months rather than six for the lumbar disk case.

Discussion of Complications

Those lesions to be considered in the differential diagnosis are most commonly confined to the neck and shoulder.

1. *Acute Trauma*: A. Fractures, dislocations and sprains of the clavicle, scapula and humerus, cervical spine, shoulder and acromio-clavicular joint. These have definite history of an injury.

B. Tear of musculo-tendinous cuff, especially the supraspinatus tendon. Do not always have a clear history of injury because of degeneration of the tendon over a long period. The disability causes weakness of active abduction but passive motion is usually of full range. Pain is not a prominent feature.

2. *Subdeltoid bursitis* (or supraspinatus tendonitis) is not associated with injury. The onset is usually sudden, pain is severe in the shoulder, but radiates as far as the hand at times and in the region of the trapezius muscle. There is pain on active and passive motion of the shoulder joint (scapulo-humeral) and there is local tenderness.

3. *Supra (or infra) spinatus tendonitis* with calcification is similar to subdeltoid bursitis, but x-ray shows calcification in the tendon.

4. *Periarthritis (adhesive capsulitis or frozen shoulder)* causes both pain on motion and severe limitation of active and passive scapulo-humeral motion.

5. *Arthritis*: A. Cervical spine.—Osteoarthritis. The symptoms and signs are chiefly in the neck but pain may be referred to the shoulder and even to the fingers. No physical signs are found in the shoulders. X-ray examination shows arthritis.

B. Shoulder joint—rheumatoid arthritis occasionally begins in the shoulder without involvement of other joints. It is similar to periarthritis at first but the sedimentation rate is elevated and the patient may have fever.

6. *Cervical rib* or scalenus anticus syndrome may allow full shoulder motion without pain on passive motion. The pain is worse in the upright position and is relieved by supporting the arm. Traction on the arm may obliterate the pulse and increase the pain.

7. *Fibromyositis* may follow exposure or exertion, is usually of short duration, and the physical findings are minimal excepting for muscle tenderness.

Brachial neuritis and tumors of the plexus or peripheral nerves cause confusion at times. But a careful history and neurologic examination will usually promptly exclude these conditions. A plexus tumor was successfully removed last week which had caused symptoms suggesting a cervical disk, but point tenderness in the neck and a palpable tumor made the correct diagnosis possible.

In conclusion, an examiner should remember that a ruptured cervical disk is a frequent lesion and, if correctly diagnosed and treated, can spare a patient prolonged suffering and financial disability.

Wainwright Building.

XUM

PSYCHOSOMATIC MEDICINE: MECHANISMS COMMON TO SOME GASTRO-INTESTINAL DYSFUNCTIONS*

JOHN F. WILLIAMS, M.D.,
Richmond, Virginia.

"Many deaths take place in men before they come to die." (Gordon Bottomley).

The griping belly is one of the most difficult problems in medicine. A long, costly, repetitious and painful search for organic pathology as a direct or indirect cause often proves fruitless. But little or no attention is given to the *person* who has the chronic bellyache. How long shall we, as physicians, continue to disregard the patient as an integrated whole, mind-body not separated?

In a series of 200 patients reviewed by me in 1946 the site of the chief complaint in 53% was in the gastro-intestinal tract.[1]

SITE OF CHIEF COMPLAINT

	No.	%
Multiple	96	48.0
G. I.	53	26.5
Musculo Skel.	13	6.5
Resp.	9	4.5
Heart	9	4.5
Head	7	3.5
N. S.‡	5	2.5
Genital	3	1.5
Urinary	3	1.5
(Diabetic)	2	1.0
	200	100.0

‡Four were multiple sclerotics, two of whom were previously diagnosed as neurotic.

Material for this paper is taken from a study of 100 patients having "functional" gastro-intestinal disease. There are striking similarities in the life stories and certain dominant factors are common to the group: surgery, anxiety, dominant mother or father, 68% married, dominant husband or wife, menstrual difficulties, child-bearing and child-rearing difficulties.

They are discouraged and depressed, and confusion about the medical and surgical advice given them is an additional burden. Insomnia, easy fatigability, decreased sex drive, and job, school or marriage difficulties are frequent. As individuals they are extremely meticulous and overly conscientious. They have periods of high work productivity, followed by illness caused by "overwork", requiring from a few hours to days or weeks for recuperation. They seem eager to cooperate and they give explanations in which they attempt to justify their thoughts and deeds—their very lives.

As these patients are studied one realizes that, in most, the condition has it origin in early life—possibly in the prenatal stage, according to Halliday[2].

Certain circumstances bring about lack of love. These circumstances may sensitize very early in life. Should these constellations reappear in later stages of life there is reaction. Such reaction varies directly with the stress and is accompanied by deranged physiology of the gastro-intestinal tract—an "allergy to circumstance."

There is an immaturity and a tendency to self-sacrifice connected with their lack of love-food.

As love-food produces satisfaction and security, so will the lack of love-food produce dissatisfaction and insecurity.

Love-food is taken in by the gastro-intestinal system, therefore, the lack of it is *felt* in the same system. The gastro-intestinal tract has been called "the sounding board of the emotions."

To the newborn infant food and love are synonymous. Ideally they come from the same source, mother: a deprivation of either, partial or complete, will cause illness or death. When the enfolding arms of the mother hold the infant in contact with the breast the warm flow of milk, the gentle rocking, the soothing murmurs produce the ultimate in satisfaction. The baby is loved and fed. He feels warm, satisfied, and secure. Satisfaction and security are necessary for his normal development—mind and body.

But what occurs if the baby is fed, let us say, on a strict schedule by a tired, discouraged, bored or immature mother? The indifferent offering of the unloving breast or the propping up of a hard impersonal nursing bottle are acts without love. The baby will make every effort to secure love and will call for attention by crying, restless movements, "colic", broken sleep, refusal of food and the like.

Variability exists in love offered and love needed. Some mothers have little or no love to give, and

*Read before the annual meeting of the Medical Society of Virginia at Fort Monroe, October 9-12, 1949.

some infants seem to have greater need for love.

Great mental stress or anxiety of the mother influences the health of the baby. An immature mother often becomes panic-stricken when faced with the intolerable burden of caring for her baby. It has been said that, unconsciously, such a mother resents the baby because she, herself, longs for the security and absence of responsibility of infancy.

Loss of the mother by any means, with enforced care by an unacceptable mother substitute, is a frequent finding. But whatever the causes, lack of love or loss of love is intolerable and the infant will attempt to get it. Failure to receive love is met by seeking the next most comforting condition—approval. If this is not found, then strenuous efforts are made to avoid disapproval. This approval seeking-disapproval-avoiding mechanism is the major finding in this series. So common is it that, after listening to the symptoms of a patient with "functional" gastro-intestinal disturbance, one can almost always back-cast the emotional factors in early life largely responsible for them.

These patients become conditioned early to approval seeking-disapproval avoiding. They become the "good" children, the "good" students, the "good" employees. They appear to be models of good character. They seem to be generous and steadfast friends. But, if any situation disturbs their delicate emotional balance, they show infantile reaction patterns which appear as derangements of the gastro-intestinal tract.

In their relations with others, the reaction to a dominant individual is characteristic. There is a carrying over—a transfer of attitude to the dominant person who becomes, in the patient's not conscious mind, the unloving parent image.

The teacher has a profound influence upon these patients. "Indigestion", "delicate stomach", "bowel trouble", "chronic" appendix, are frequently encountered in the history of the school years.

Later, in the working world, relationships with fellow employees and with employers afford a wide and fertile field for a variety of situations. Emotional crises because of approval seeking-disapproval avoiding are inevitable. These are accompanied by somatic showers to the gastro-intestinal tract with the usual fatigue, headache, insomnia, and anxiety.

Marriage, according to the partial analysis of this series, is a dreary procession of breakdowns—of bearing without fortitude the mature responsibilities of mating and parenthood.

In the women a history of pelvic as well as abdominal surgery is found in almost all. Menstrual difficulties are in 100% and the menopause is prolonged and stormy. Pregnancy is dreaded. Childbearing is arduous and followed by a delayed exhausted recovery period.

The men are dispirited but "good" parents who demonstrate an almost fanatical approval seeking-disapproval avoiding. Although not impotent, there is definite decrease in sexual appetite.

One of the most remarkable findings is the constancy with which the patients in this series have married dominant partners. Unhappiness is the rule but divorce is infrequent. There is a definite tendency to self-sacrifice. They shoulder the load of responsibility and trouble for their families and friends.

From this preliminary study this almost constant characteristic appears to be part of the love deprivation gastro-intestinal syndrome. However, this tendency also appears in certain other psychosomatic illnesses. It is quite possible that certain factors are fundamental to all neuroses. This will be given further study in other papers now in preparation.

In this series the approval seeking-disapproval avoidance mechanism was found in all patients. Bearing this in mind is a workup of a patient with functional gastro-intestinal disease complete, *unless* there is added to the classical physical and laboratory examinations a thorough psychiatric examination.

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1000 West Franklin Street.

DISCUSSION

DR. JOHN TAYLOR RANSONE, Newport News: I have very much enjoyed this paper, including the philosophical idea of love and food having a close connection. But for the good of those present I want to ask if we do not forget the work of Walter B. Cannon, in 1909, on "The Influence of Emotional States on the Functions of the Alimentary Canal" and, in 1915, his "Bodily Changes in Pain, Hunger, Fear, and Rage", and the compilation of research by H. Flanders Dunbar, in 1935, entitled "Emotions and Bodily Changes." Also, Alvarez, in 1943, threw a lot of light on what is really happening in his "Nervousness, Indigestion, and

Pain". It seems to me that most of these gastro-intestinal symptoms of functional type are due to too much adrenalin stimulation, or the reverse, or the change from one to the other.

DR. WILLIAMS, closing the discussion: Thank you, Dr. Ransone. I am not sure if your comments are entirely clear to me. May I refer you to my original paper presented at the Virginia State Society in 1946. In that paper the bibliography is fairly complete. Naturally I assume when I used the title "Psychosomatic Medicine," etc., that it will be taken for granted that I am quite familiar with the work of the pioneers of my speciality.

Terramycin Reported Effective Against Two Types of Pneumonia.

Results indicate that terramycin, a newer antibiotic drug derived from a mold, is remarkably effective against both pneumococcic and virus pneumonia, a group of New York doctors report in the August 12 *J.A.M.A.*

Terramycin proved to be valuable in treating 18 patients with pneumonia due to pneumococcus microbes and seven patients with virus pneumonia, Drs. George W. Melcher, Jr., Count D. Gibson, Jr., Harry M. Rose and Yale Kneeland, Jr., of the Columbia University College of Physicians and Surgeons and Presbyterian Hospital say.

The drug was administered by mouth in the form of tablets or capsules. Vomiting and nausea occurred in some patients as side effects of terramycin, but these symptoms seemed less severe than similar reactions observed in patients following administration of aureomycin, according to the doctors.

New Drug Against Toxic Goiter.

Promising results in treating patients for toxic goiter with a new synthetic drug, tapazol, are reported by Drs. William S. Reveno and Herbert Rosenbaum from Wayne University College of Medicine, Detroit (August 19, *J.A.M.A.*).

These findings should be considered preliminary. The drug has been used in only 18 patients and observations have covered only a six-month period.

Tapazol is not now generally available to doctors. Its use is limited to experimental studies. The drug is an antithyroid compound with action 25 times as powerful as propylthiouracil, a compound commonly used in treating overactivity of the thyroid gland, according to the doctors. Abatement of symptoms occurred in patients with toxic goiter variously five, six and eight weeks after administration of tapazol was begun, according to the article. Two patients who had relapsed after treatment with propylthiouracil were relieved after 57 and 51 days of treatment with tapazol, respectively.

"In the small group of patients observed, tapazol exhibited effective antithyroid activity closely resembling that of propylthiouracil but with a potency approximately 25 times greater."

"Toxic reactions were not encountered, but more time and treatment of a larger number of patients will be required for assessment of this highly important factor."

XUM

THE USE OF THE MALE SEX HORMONE IN THE INHIBITION AND SUPPRESSION OF LACTATION*

Joseph C. Parker, M.D.,
Richmond, Virginia.

The problem of inhibition of lactation in obstetrical patients has become increasingly frequent in the past several years. While the older methods of inhibition and suppression of lactation, such as the use of breast binders, ice bags, etc., have proven in the main very effective, there are some objections to these methods on the part of both patients and physicians. One of the most frequent objections voiced by the patient during the process of inhibition or suppression of lactation is that of discomfort. Another complaint against the breast binder is the cosmetic objection voiced by some patients. With a tight breast binder in place, respiratory excursions are certainly hampered and limited in extent. This, of course, raises the problem of improper aeration of the lungs, particularly where there is potential or actual pulmonary infection. Furthermore, unless the breast binder is properly and expertly applied, the incidence of mammary abscess is materially raised.

Thus, the problem resolves itself, in so far as the author is concerned, into the use of an agent to inhibit lactation, or suppress an already established lactation, over-coming the objections enumerated above, without producing additional unpleasant and unwanted side reactions. Some and varied forms of estrogenic, or estrogen like, substances have been employed for this purpose, and with very good results in so far as the primary objective for which they are used is concerned. However, there are two chief objections to this form of therapy. The first is that lactation, once suppressed or inhibited, tends to recur following the cessation of use of the drug. Secondly, a good many users of this type of drug have reported withdrawal vaginal bleeding, in excessive amounts, when the drug is stopped. The reports concerning the carcinogenic properties of the estrogen and estrogen like substances are so conflicting and unsubstantial in respect to the human, that this factor is not considered seriously here. However, it is certainly worth while considering all potentialities and possibilities resulting from the use of any therapeutic agent before using it indiscriminately, particularly when dealing with any type of hormone therapy.

Therefore, considering the need for such an agent, and taking into account the objections to the above used measures, it was decided to try to determine the effectiveness of the male sex hormone in the management of this problem. The action of the male sex hormone, like that of the estrogens or estrogen like substances in the inhibition or suppression of lactation, is thought to be through suppression of the production of the lactogenic hormone by the anterior lobe of the pituitary gland. The androgenic hormone has the advantage over its counterpart, estrogen *et al.*, in that it does not produce a growth effect on the endometrium. Consequently, when the therapy is stopped, vaginal bleeding is not an entity to be reckoned with, as is the case when estrogenic substances are used. Furthermore, the reports so far observed indicate no possible carcinogenic factor to be considered when this agent is employed in the female. The chief objection so far voiced against the use of androgenic substances in the female is that of virilization. When the drug is employed for the purposes herein stated, the dose is so small as to negate that possibility. There may be an atrophic effect on the vaginal mucosa and endometrium, but again the small dosages employed in this series did not produce any clinical evidence of such action.

The material used in this study consisted of forty-two unselected cases in which androgenic substance was used to inhibit the onset or suppress an already established lactation. At the beginning of the study ten patients were given oral testosterone in the form of linguets in 6 mgm. sizes. However, it was decided that the injectable drug would be cheaper in the long run due to the relatively low dosage of injectable testosterone as compared with the oral form of the preparation. The injectable form also offers the additional advantage of faster action with less bother to the patient.

There were ten patients in this series who received an oral form of the male sex hormone, either methyl testosterone (10 mgm. tablets) or lingusorbs (Ayerst)

*Read before the Richmond Obstetrical and Gynecological Society in Richmond, December 16, 1949.

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(6 mgm. tablets), the latter being absorbed from the buccal mucosa, while the former are swallowed. The dosage of these two drugs employed varied from a total dose of 450 mgm. of methyl testosterone to 216 mgm. of lingusorbs (Ayerst).

The drug was usually started on the first postpartum day if inhibition of lactation was desired, and at varying times during the puerperium to suppress an already established lactation. The methyl testosterone was employed in 30 mgm. doses three times daily for a period of from three to five days in three patients, resulting in complete inhibition of lactation in all three cases. There were no undesirable side effects noted in any case. The lingusorbs (Ayerst) were used in doses of 18 mgm. three times daily for four days in seven patients. Four of these patients did not receive the drug regularly and one of them had her breasts pumped and bound on the fourth postpartum day resulting in suppression of lactation without further complications. All four of these patients had moderate engorgement of the breasts accompanying moderate secretion, but none of them suffered any inflammation or infection. Three of them required no additional methods to suppress the lactation in spite of the irregularity of consumption of the drug. A slight amount of lactation was noted in all patients receiving the oral form of the drug for several days, but by the time of discharge, usually on the seventh day, all of them were "dry". The only adjunct to hormone therapy used in the series was the employment of a well fitting brassiere to support the breasts. The three patients who received the lingusorbs (Ayerst) regularly had lactation inhibited without incident.

Of the remaining thirty-two patients in this series all of them received injectable testosterone in total dosages of 100 to 150 mgm. The material used in this study was testosterone 100 mgm. per c.c. in aqueous suspension, and was furnished by Ayerst, McKenna, and Harrison. As was the case in the employment of oral testosterone, the majority of the patients were started on the drug on the first postpartum day to inhibit lactation. The dosage employed was 50 mgm., I.M., on two successive days in twenty-eight cases, while four cases received a third injection of 50 mgm., I.M., to completely stop lactation or reduce engorgement.

In no case were there any side effects or infection noted. Three patients (10%) were classified as having slight engorgement, while three (10%) were classified as having moderate engorgement. There were no cases of severe engorgement noted in this series.

Thus in the thirty-two patients, in whom injectable testosterone was used to inhibit lactation, 6 or 20% had some classification of engorged breasts. Seventeen or 53% of these patients had slight leakage of milk for from one to five days after the initiation of treatment. One or 3% had moderate lactation. This gives a total of eighteen or 56% with some amount of lactation for several days following the use of this drug. However, in no case were additional methods required to completely inhibit lactation other than the use of an additional 50 mgm. of testosterone, I.M., as noted above. In no case in this series was there noted any excessive vaginal bleeding either during or immediately following treatment or at the time of resumption of normal menses. There was also no particular delay noted in the time of resumption of normal menses, the majority of the patients menstruated normally by the time of the six weeks check up examination.

SUMMARY

Forty-two unselected cases are reported in which testosterone, either in oral or injectable form, was used to inhibit or suppress lactation.

Discounting the four patients who did not receive the oral preparation regularly, there was suppression of lactation in 100% without undesirable side effects in any.

There were no cases of infection of the breasts, and relatively few with engorgement of any consequence (3 cases or 10%).

No additional methods of inhibition or suppression of lactation were required in any case where the drug was given regularly and on schedule other than an occasional extra 50 mgm., I.M.

CONCLUSION

It is believed that injectable testosterone in 50 mgm. doses on two successive days is a safe and effective means of inhibiting or suppressing lactation. The drug can be given at any time during or before the onset of lactation with good results. Side effects such as virilization, excessive vaginal bleeding, or irregular vaginal bleeding were not found to occur in this small series.

1001 West Franklin Street.

CLINICAL PATHOLOGICAL CONFERENCE*

From the Case Records of the Medical College of Virginia and the University of Virginia Hospitals.

Harry Walker, M.D., *Editor*
William Kay, M.D., *Associate Editor*

Case No. 1.

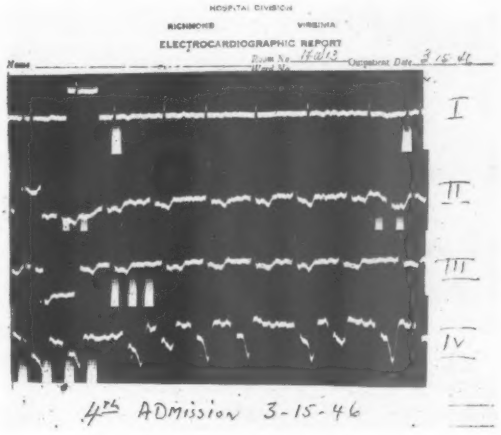
Protocol from Medical College of Virginia

Clinical Discussion—J. Edwin Wood, M.D., Professor of Practice of Medicine, University of Virginia, Department of Medicine

Pathological Discussion — Gordon R. Henniger, M.D., Associate Professor of Pathology, Medical College of Virginia

First Admission

On February 17, 1934, a 19 year old white boy drove his car into a bridge. The car turned over, caught fire, and he was pinned under it. Passersby were able to drag him out and he was admitted about a half-hour later in a somewhat drowsy state. Blood pressure 130/90. There were severe burns of the extremities, a depressed fracture of the left frontal bone, and lacerations of the scalp and chin. The heart, lungs, and abdomen were normal.



The urine was normal save for a heavy trace of albumin and a sediment showing 20-25 RBC, an occasional WBC, many hyaline and a few granular casts. The hemoglobin was 90%, RBC 4,720,000, and WBC 34,000, with 88% polys., 9% lymphs., and 3 early cells. The Wassermann was negative.

Course: During the first few days he was confused and the temperature was constantly 101-102° F. The wounds and burns were healing. The temperature then rose to 103-104 and there were findings of consolidation in the right lung. By x-ray this was chiefly in the middle lobe with some mottling of the upper lobe. The WBC was 28,800 with 90% polys., 9% lymphs., and 1 early cell.

During the ensuing 2-3 weeks he cleared up mentally and the temperature trended downward, but was always elevated. A second x-ray showed clearing of the right lung. The CTR was 38%. The aorta appeared normal. The right interlobar pleura was thickened.

On the 25th day his abdomen became distended with evidence of free fluid and the liver edge was felt four fingers below the costal margin. The spleen was not felt. There was no jaundice. In the next day or two this distention became more marked, the superficial veins over the abdomen and lower chest were prominent, and there was edema of the abdominal wall which stopped abruptly at Poupart's ligament below, but extended onto the lower chest wall above. The hemoglobin was 73%, RBC 3,940,000 and WBC 9,500 with polys., 78%, and lymphs., 22%. The icteric index was 13 units. The blood NPN, sugar, and chlorides were normal. The temperature was now of septic type from normal or 99 to 101-102 daily. After four injections of salyrgan the abdomen subsided considerably.

During the next six weeks he gradually improved and was discharged on the 68th day in good condition.

Second Admission—Three Weeks Later

For 6-8 days after discharge he had felt fine. He then developed an aching pain in his right shoulder and felt pepless. This continued and he began to have pain in the right upper quadrant, aggravated by deep breathing. All grew worse.

*To be presented before the Medical Society of Virginia at its meeting in Roanoke, October 9, 1950.

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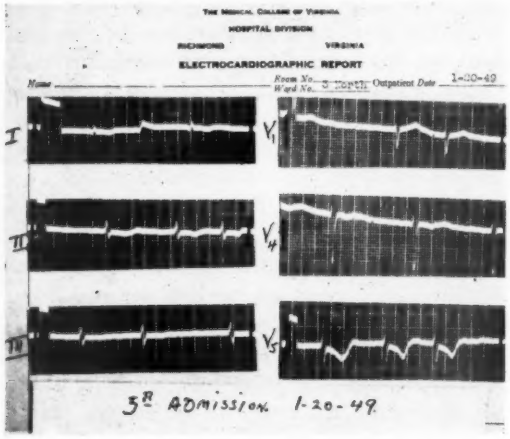
On examination the temperature was 98.6, pulse 90, respiration 20, and blood pressure 130/80. The heart and lungs were normal except for a systolic apical murmur not heard by all examiners. The abdomen was considerably distended with fluid. The liver was 4-5 fingers below the costal margin. The wounds and burns were well healed except for one area on the left leg which showed moderate infection.



The urine show 1+ albumin, and a few hyaline and occasional waxy and granular casts. The blood counts were normal as were the PSP kidney function test and the icteric index. X-ray films and fluoroscopy showed normal lungs with a somewhat high right diaphragm which was normal in contour but did not move too well. "The heart appeared slightly larger than the average". The right interlobar pleura was seen.

Course: During the first 48 hours his temperature reached 101. Thereafter it never exceeded 99.2. All findings promptly subsided and he was discharged on the 23rd day after treatment of the left leg burn.

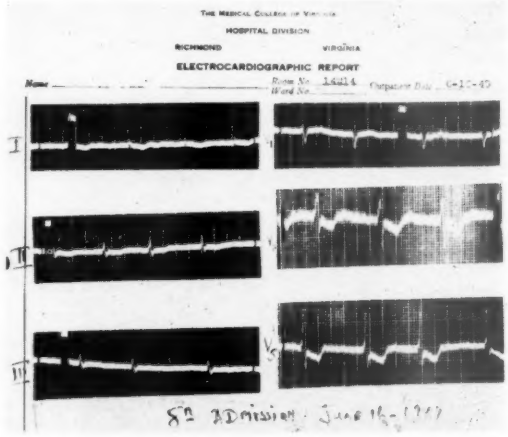
THIRD ADMISSION—FIVE YEARS LATER—AGE 24

On the night of October 17, 1939, he drove into another car and both knees were thrown against the dashboard; following this he could not walk. Examination showed fractures of both patellae. The heart was normal in size. There was a loud blowing systolic murmur over the precordium. The blood pressure was 90/65 at first, leveling off at 130/70. He stated that he had been refused for insurance a year or so before because of a heart murmur. As a child he had had scarlet fever. No history of rheumatic fever. The urine, blood counts, and Wassermann were normal. The patellae were repaired. His progress was slow but satisfactory and he left on the 67th hospital day.

FOURTH ADMISSION—SEVEN YEARS LATER—AGE 31 (3-14-46)

On the day of entry he had sudden severe pain in the right flank, requiring two hypos for relief. In previous months he had had several similar but milder attacks; he stated that his physician found blood in his urine in one of these.

Some five years before (i.e. a year or two after his third admission above) he had noted the gradual onset of swelling of the feet and ankles and shortness of breath. He saw a physician who gave him digitalis, which he had taken since, and had been troubled little or none by these symptoms. (This physician, an experienced clinician, states that the patient came by his office late one afternoon in 1940 or '41—records misplaced—in moderate congestive failure with a grossly irregular cardiac rhythm.



There was a to and fro apical murmur and the heart seemed considerably enlarged. Hospitalization was advised and refused. Patient was given digitalis, but did not return. This doctor saw him on the street some days later and he seemed to be doing well.)

On examination he seemed to be in pain, with temperature 97.4, pulse 100, respiration 18, and blood pressure 130/80. The lungs were clear. The heart seemed enlarged and the rhythm was grossly

irregular. No murmurs were heard (three examiners, including the physician who saw him in 1940 or '41 above). The abdomen was normal and there was no edema.

The urine was normal except for a 1+ albumin. The hemoglobin, RBC, differential, NPN and Wassermann were normal. The WBC was 13,000 with 81% polys. An electrocardiogram showed auricular fibrillation with low T_1, low ST_2 and negative T_2, low ST_3, diphasic T_3, and low ST_4 with negative T_4.

Direct cystoscopy and pyelograms were normal. He was discharged on the 4th hospital day on digitalis, grains 1½.

FIFTH ADMISSION—THREE YEARS LATER—AGE 34 (1-19-49)

He had been getting along pretty well working as a draftsman until one week before admission he had several nose bleeds. Shortly thereafter he had pain in the right lower chest and the right upper abdomen felt sore and tender. He began to have swelling of the feet and ankles and got out of breath unusually easily. These symptoms grew worse.

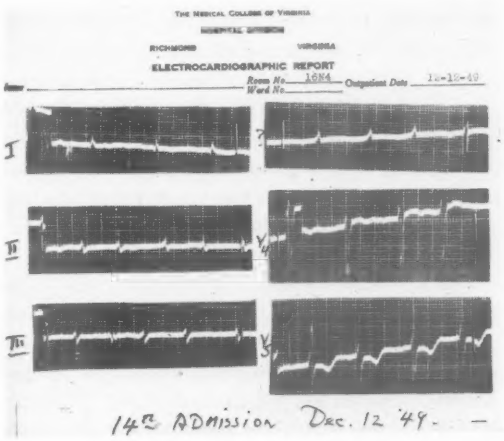
On examination he was in no distress. The temperature was 99.8, pulse 88, respiration 20, blood pressure 160/95, and weight 166 pounds. The neck veins were distended. There was evidence of fluid in the right pleural cavity. The cardiac apex was in the anterior axillary line in the 6th or 7th space. The rhythm was grossly irregular. No murmurs were heard. The liver was 2 fingers below the costal margin and somewhat tender. The abdomen contained a small amount of fluid, and there was edema of the shins, ankles, and feet.

The urine, blood counts, NPN, and sugar were normal. The flocculation test for syphilis was positive and the Wassermann negative; a repeat showed both doubtful. An electrocardiogram showed auricular fibrillation at rate of 60. The QRS complexes were low and somewhat slurred in the limb leads; T_1 was negative or diphasic; T_2 negative; T_3 negative or isolectric; T diphasic in V_4 and negative in V_5. A chest film showed enlargement of the cardiac shadow, with pericardial effusion suggested. The CTR was 64%. A small amount of fluid was suggested at the right costophrenic angle.

Course: He was kept in bed on a salt free diet, digitalis, ammonium chloride, and mercurial diuretics. He lost 21 lbs. in eight days. His blood pressure ranged from 130-140/90-85. He became symptom free and was discharged on the 8th hospital day to follow a salt free diet with Westsal, digitalis grains 1½, and ammonium chloride grains 60, daily.

SIXTH ADMISSION—ELEVEN DAYS LATER—(2-7-49)

For a week he had gotten along pretty well and then the edema recurred. His weight rose to 153. He was nauseated at times and vomited occasionally. He became confused and antagonistic. Examination showed nothing new. The urine had a specific gravity of 1.009 with 2+ albumin, and many hyaline casts and 3-4 WBC/HPF. The blood counts and blood sugar were normal. The blood NPN was 56, chlorides 94 (serum under oil), sodium 134 and potassium 4.8 meq. The flocculation test for syphilis



was positive and Wassermann negative. The icteric index was 12 units, cephalin cholesterol 3+, blood proteins 7.4 grams % with albumin 4.1, serum bilirubin 1 mgm., and BSP 15% retention.

Course: He became more confused and uncontrollable, requiring transfer to the Nervous and Mental Section. His temperature did not exceed 98.8 and his blood pressure ranged around 120/80. Several electrocardiograms showed auricular fibrillation at rate of 50 with low slurred QRS complexes and isolectric or slightly negative T waves in the limb leads. T was negative in V_4 and V_5. A spinal puncture yielded clear fluid with protein 40, 1 cell, mastic 0-0-0-0-0, chlorides 115 meq., and Wassermann negative. A repeat flocculation and Wassermann on the blood were negative.

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Improvement was gradual and he left the hospital on the 37th day, mentally clear and fairly well compensated.

During the next three months he was little changed. Venesection of 500 cc. in the hospital seemed to relieve his edema and congestion for a short time on one occasion. The laboratory tests, including electrocardiograms, were the same except that the NPN was normal several times. The temperature was normal and the blood pressure was 120/80.

On June 15, 1949, he was admitted for the eighth time because of ascites and bilateral pleural effusion. He was somewhat breathless. The urine showed 1+ albumin. The blood counts, sugar, and NPN were normal. The blood chlorides were 90.1, sodium 127, and potassium 4.2 meq.; the proteins were 6.65 with albumin 3.17. A second phlebotomy was not helpful. He was placed on a soft diet with salt and the ammonium chloride omitted, without benefit. The previous program of salt free diet, ammonium chloride, mercurials, and digitalis were resumed with gradual improvement and he left the hospital on the 18th day after a weight loss of 13 lbs.

From July 1 to December 10, 1949, he was admitted a number of times, chiefly for the removal of pleural or abdominal fluid. Examination of the heart was the same. The chest fluid had a specific gravity of 1.014, protein 3.5 grams %, and cells 318; the abdominal fluid had a specific gravity of 1.018, protein 3.6 grams %, and 662 cells with 81 polys. The treatment program was otherwise unchanged. His general condition declined. He later developed a sore mouth and gums and the mercurials were omitted. A number of urinalyses and electrocardiograms were unchanged. The hemoglobin dropped to 10.8 grams and the RBC to 3,560,000. The WBC and differential were normal. The blood proteins were 5.7 grams % with 2.9 albumin.

FOURTEENTH ADMISSION—DECEMBER 11, 1949

The night before, he experienced a sharp pain in the right lower chest and examination suggested consolidation in the right lower lobe. His temperature was 101. The sore mouth was still present. The urine showed 3+ albumin with a sediment containing 3-5 WBC, 1-2 RBC, innumerable hyaline and finely granular casts, and 30-40 coarsely granular casts per high power field. The hemoglobin was 11.1, RBC 3,620,000, and WBC 18,800 with 86% polys. X-ray showed a density at the right base suggesting fluid with pulmonary infiltration not excluded. The heart was enlarged with prominence of the left ventricle. The electrocardiogram was unchanged except that T in V_4 was upright.

Course: His digitalis was continued and he was given crysticillin, 300,000 units b.i.d. His temperature fell sharply to normal on the second hospital day and his WBC was 8,900 with 77% polys. on the third hospital day. His lungs cleared and he was discharged on the eighth day.

FIFTEENTH AND FINAL ADMISSION—14 DAYS LATER—AGE 35—(1-2-50)

The ascites reaccumulated and he became more short of breath and orthopneic, with a dry cough. Examination showed bilateral pleural effusion, especially right, ascites and marked edema of the legs. The heart was essentially unchanged. Blood pressure 110/70 to 140/80. There was a small superficial ulcer on the left ankle. The hemoglobin was 11.2, RBC 3,400,000, and WBC 7,800 with 75% polys. The urine showed 2+ albumin with 0-1 RBC, 0-1 WBC, and 1-3 finely granular casts in the sediment. The flocculation test for syphilis was negative.

Course: 6,000 cc. of straw-colored fluid was removed from the abdomen. The right pleural cavity was aspirated a number of times yielding 1,800, 1,725, and 1,635 cc. of similar fluid, the last amount being removed on the 13th day. On the 15th day he had a shaking chill and his temperature rose to 104. He became nauseated and vomited. The left calf was tender and this leg was more swollen than the right. Homan's sign was positive on the left. Penicillin was begun. The prothrombin concentration was 28%. 50 mgm. of dicoumarol was given every few days with the prothrombin concentration ranging from 16 to 33%. Three blood cultures were sterile. The temperature subsided suddenly, lasting only 36 hours. The right chest and abdomen were aspirated again yielding 1,500 and 5,000 cc. of fluid respectively. On the 33rd day mercurials were resumed as he had had none for two months. The ammonium chloride and digitalis had been continued. The ulcer over the left external malleolus grew larger and similar ulcers developed over the left Achilles tendon and the sacrum. He seemed to be feeling better.

On the 39th hospital day about 6:00 P. M. he was talking to his wife when he suddenly said "Wait a

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minute, I have a pain in my chest" and fell back dead.

Case No. 2.

PROTOCOL FROM UNIVERSITY OF VIRGINIA, DEPARTMENT OF MEDICINE

Clinical Discussion—KINLOCH NELSON, M.D., Professor of Clinical Medicine, Medical College of Virginia

Pathological Discussion—JAMES R. CASH, M.D., Walter Reed Professor of Pathology, University of Virginia, Department of Medicine

This is the history of a 71 year old, white housewife who was admitted to the University of Virginia Hospital for nine days May 1950, discharged for a brief period, and then re-admitted to the same hospital for eighteen days in June 1950.

The patient's first admission was on May 23, 1950. At that time the chief complaint was weakness, weight loss and nausea of about five weeks' duration. The patient stated that she had been in good health until about six months prior to admission. At this time she noticed that she was slightly weaker than usual. Weakness apparently was minimal until about five weeks prior to admission when she became markedly weak and noticed that she was losing weight. Mild constipation began about six months before admission for which she took laxatives. These symptoms were accompanied by anorexia, nausea and occasional vomiting. Loss of appetite was definite from the beginning, but spitting up food was irregular and unpredictable. The patient's usual weight was said to be about 160 pounds and she weighed 125 pounds on admission. There were no other complaints and a system's review was entirely negative. Past medical history was not remarkable.

Examination at the time of admission revealed normal temperature, pulse 100, blood pressure 150/84. There was diffuse enlargement of the thyroid gland and with no nodules palpable. There was some dorsal kyphosis, with increased antero-posterior diameter of the chest. The chest was clear to auscultation and percussion. The heart was not enlarged and there was a loud systolic murmur at the apex. A systolic murmur was also heard to the left of the sternum. The rhythm was regular. Examination of the abdomen was negative. Pelvic examination showed rectocele, slight cystocele, slight excoriation of the cervix and a cervical polyp. The remainder of the physical examination was not remarkable.

Proctoscopic examination was normal.

Laboratory studies at the time of this admission revealed RBC of 4,500,000 with 14 grams of hemoglobin. WBC was 9,000. Wassermann and Kahn tests were negative. Urinalysis showed a specific gravity of 1.016, 2+ albumin, no sugar, 2 to 3 w.b.c. per h.p.f., no r.b.c. per h.p.f. and 1 to 2 casts. Repeat urinalysis showed a slight trace of albumin but no other abnormalities and another repeat catheterized specimen showed no albumin and was entirely within the limits of normal.

A stool examination was normal. Blood urea was 57 mgm./100 cc. on May 25, and 29 mgm./100 cc. two days later. Total protein was 7.4% with a normal A/G ratio. Fasting blood sugars showed 100 mgm./100 cc., 135 mgm./100 cc. and 154 mgm./100 cc. Sedimentation rate was 13 mm. in an hour. A PSP test showed 35% excretion of the dye in two hours' time. Gastric analysis showed the presence of free hydrochloric acid after histamine. Agglutinations for tularemia, brucellosis and typhoid were all negative.

The electrocardiograms on the first admission, taken 5/27/50, showed sinus tachycardia, rate 102, normal conduction time, a slight notching of the QRS complexes in Lead III, but actually the tracing was considered normal.

Fluoroscopic X-ray examination of the esophagus, stomach and duodenum revealed no evidence of lesions. In 4½ hours the stomach was empty and the head of the barium meal in the splenic flexure. The X-ray consultant considered the stomach and duodenum normal, and noted some hypertrophic changes in the lumbosacral spine. During her hospital stay she ran a low grade fever at times ranging from 99° F. to 100° F. orally, but was otherwise asymptomatic. She was very quiet and seemed somewhat depressed. Her weight remained constant during her hospital stay. The patient was discharged from the hospital on May 31, 1950. She was given general instructions as to diet and symptomatic treatment, but no specific medication and was advised to keep in touch with the outpatient department for further observation.

Two weeks after her discharge she was referred

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back to this hospital and re-admitted on June 17, 1950. On admission she stated that she had been all right up until a day or so before although she continued to feel weak. On the day prior to readmission she developed a belching attack and states that because of the belching she was sent to the hospital. A physician's note sent with the patient indicated that she had been running a low grade fever and rapid pulse, and that her cardiac murmur had increased in intensity. Repeated attempts to obtain a more detailed and specific history failed, owing to apathy and weakness. No pain occurred at any time.

Examination at the time of admission revealed temperature of 99.6° F., pulse 96, blood pressure 130/70. Thyroid enlargement was again noted and it was felt that there was a nodule present in the right lobe. The heart did not seem to be enlarged and there was normal rate and rhythm. There was a systolic murmur over the entire precordium heard best at the apex. The abdomen was negative, except for diffuse voluntary spasm. Dorsal kyphosis was again noted. The remainder of the examination was not remarkable. During this second admission the patient again ran a temperature ranging from 99° F. to 100° F. during the first week, and increasing slightly during the next week to 100° F. to 101° F., and finally reaching a sustained temperature of 104° F. to 105° F. on the last four days of her illness. The pulse rate varied from 90 to 140.

During this second admission seven catheterized specimens were done between 6/18/50 and 7/3/50 and showed specific gravities ranging from 1.014 to 1.026, an occasional slight trace of albumin, no sugar, white cells in the sediment varying from 2 to 6 per h.p.f., with occasional red cells from 1 to 2 per h.p.f. and an occasional small granular hyaline cast ranging as high as eight hyaline casts per h.p.f.

One routine stool showed a 4+ benzidine on this second admission but two other stools were negative for the benzidine test, and otherwise negative.

The routine blood counts showed the hemoglobin to be 14 grams or 90%, with 4,500,000 reds, 8,600 white cells and a differential count with a slight shift to the left, but no abnormal cells. Later the hemoglobin dropped to 12 grams with a red count of 4,200,000 and a white count of 13,000 with no essential change otherwise.

The blood urea was registered at 28 mgm./100 cc. on admission, went up gradually to 62 mgm./100 cc., later back to 48 mgm./100 cc., but finally up to 140 mgm./100 cc. on 7/4/50. The blood chlorides were consistently low at 77 mEq/liter. CO_2 combining power ranged from 37 mEq/liter down to 30 mEq/liter just before death. The urea clearance was 38.6% of normal and the intravenous phthalein showed 10% in the first fifteen minutes, 17% in thirty minutes and a total of 47% for the two hours.

Gastric analysis showed ample free hydrochloric and total acid and no other remarkable findings.

Bromsulphalein studies showed a trace remaining in the blood in 45 minutes. Thymol turbidity test showed 1.8 thymol turbidity units. The serum lipase was 1.8 cc. N/20 NaOH/1 cc. serum on two occasions and on 6/29/50 the amylase was 76 mgm./100 cc. but on 6/30/50 it was 18 mgm./100 cc. The icterus index was 6, the total protein 5.5% with a normal A/G ratio. Fasting blood sugar 118 mgm./100 cc.

The bone marrow was studied carefully and considered to be within the normal range. Various bacteriological studies and agglutination tests were done. Widal was negative for B. typhosus and paratyphosus A. and B. Agglutinations for several strains of dysentery were negative and agglutinations for B. abortus, B. suis and B. tularense were all negative. A number of cultures of catheterized urine were obtained and B. coli was recovered on two occasions. Seven blood cultures taken at intervals between 6/18/50 and 7/5/50 were all negative. The Wassermann and Kahn were negative. Tuberculin tests were negative.

The spinal fluid was negative, with a zero cell count and a total protein of 45 mgm./100 cc.

Electrocardiograms were again taken and were essentially the same, although a slight increase in QRS aberration had occurred, but this was not considered remarkable.

A number of X-ray studies were attempted and the intravenous pyelogram was normal, showing normal kidney pelves, normal ureters, and no abnormality of the bladder shadow.

X-ray examination of the chest showed some slight fibrosis of the lungs which was considered nonspecific. There was nothing remarkable in the lung fields. There was a moderate amount of old calcification within the hilar regions. The heart appeared to be normal.

A barium enema studied under fluoroscopic control with pre- and post-evacuation and air insufflation studies failed to show any abnormality in the colon.

The patient was quite ill this time and it was difficult to do a second G. I. X-ray, but a food-barium meal was given and a single film made after five hours without fluoroscopy. The stomach was seen to contain only a tiny trace of the barium and it was concluded that there was no evidence of gastric retention.

X-rays of the skull were essentially normal for age.

On the second admission the patient weighed 116 pounds and gradually came down to 110 pounds the day before her death.

This patient's course was progressively down hill with fever, anorexia, nausea and vomiting with marked apathy and low blood chlorides. An attempt was made to correct the latter situation on a number of occasions, but she continued to go downhill and died on the eighteenth day of her second admission to the hospital.

Note. Discussion of these cases will appear in the Monthly after the meeting of the Medical Society of Virginia.

New Ulcer Drug Seen as Preventive of Surgery.

Most persons with serious disability from peptic ulcer can avoid surgery by receiving treatment with a new ulcer drug, banthine (trade name), early tests with one series of patients indicate. The synthetic compound, which is taken in tablet form, blocks the impulses of the nervous system which stimulate overactivity and overacidity of the stomach. It is available only on prescription by a physician and must be taken under medical supervision.

Clinical trial of banthine in 100 peptic ulcer patients is described by Drs. Keith S. Grimson, C. Keith Lyons and Robert J. Reeves of Duke University School of Medicine, Durham, N. C. (*J. A. M. A.*)

Of this group of patients, 62 were considered to have "conventional indications for surgery" before treatment with banthine was begun. Surgery was performed on five because of development of scar tissue or other special indications.

"Most of the patients were limiting their activity, restricting diet and using antacids [substances which counteract acids] before their trial of banthine," the doctors say.

"During treatment they were advised to discontinue use of antacids. With few exceptions, they were encouraged gradually to return to work and resume a normal diet during the first week or two of treatment.

"With the exception of two patients, the group has continued regular work or, if originally incapacitated, has returned to regular work. Pain of ulcer usually is relieved completely before healing can occur.

"It is much better that peptic ulcer when possible should be treated medically. It is our present opinion that banthine is a medical treatment better than that heretofore available and that need for surgery has and will decrease. Perhaps scar tissue can be avoided by prophylactic use of a simple treatment such as banthine. However, obstruction already present to a pronounced degree may lead to failure of banthine therapy and need for surgical intervention.

"Results with banthine used in lieu of rest, restriction of diet or antacids or other medicaments have been gratifying. Elimination of conventional restrictions and medical treatments necessary for study purposes, however, is not necessarily recommended as a good general practice. Occasionally because of delay of relief of pain or recurrence of pain banthine treatment has been supplemented."

XUM

Presidents of the Medical Society of Virginia

PRESIDENT	YEAR OF MEETING
*Dr. James McClurg, Richmond	1821
*Dr. William Foushee, Richmond	1822
*Dr. William Foushee, Richmond	1823
*Dr. James Henderson, Richmond	1824
Meetings Discontinued.	
*Dr. Robert William Haxall, Richmond	1841
*Dr. Robert William Haxall, Richmond	1842
*Dr. Frederick Marx, Richmond	1843
*Dr. Thomas Nelson, Richmond	1844
*Dr. William A. Patteson, Richmond	1845
*Dr. William A. Patteson, Richmond	1846
*Dr. John A. Cunningham, Richmond	1847
*Dr. William A. Patteson, Richmond	1848
	1849
*Dr. Robert William Haxall, Richmond	1850
*Dr. Beverley R. Wellford, Fredericksburg	1851
*Dr. James Beale, Richmond	1852
*Dr. Thomas P. Atkinson, Danville	1853
*Dr. Carter P. Johnson, Richmond	1854
*Dr. H. C. Worsham, Dinwiddie	1855
*Dr. H. C. Worsham, Dinwiddie	1856
*Dr. James Bolton, Richmond	1857
*Dr. Levin S. Joynes, Richmond	1858
Meetings Discontinued	
*Dr. R. S. Payne, Lynchburg	1870
*Dr. R. S. Payne, Lynchburg	1871
*Dr. A. M. Fauntleroy, Staunton	1872
*Dr. Harvey Black, Blacksburg	1873
*Dr. A. G. Tebault, London Bridge	1874
*Dr. S. C. Gleaves, Wytheville	1875
*Dr. F. D. Cunningham, Richmond	1876
*Dr. J. L. Cabell, University	1877
*Dr. J. H. Claiborne, Petersburg	1878
*Dr. L. S. Joynes, Richmond	1879
*Dr. Henry Latham, Lynchburg	1880
*Dr. Hunter McGuire, Richmond	1881
*Dr. G. W. Semple, Hampton	1882
*Dr. W. D. Cooper, Morrisville	1883
*Dr. J. E. Chancellor, Charlottesville	1884
*Dr. S. K. Jackson, Norfolk	1885
*Dr. Rawley W. Martin, Chatham	1886
*Dr. Bedford Brown, Alexandria	1887
*Dr. Benjamin Blackford, Lynchburg	1888
*Dr. E. W. Row, Orange C. H.	1889
*Dr. Oscar Wiley, Salem	1890
*Dr. W. W. Parker, Richmond	1891
*Dr. H. Grey Latham, Lynchburg	1892
*Dr. Herbert M. Nash, Norfolk	1893
*Dr. Wm. P. McGuire, Winchester	1894
*Dr. Robt. J. Preston, Abingdon	1895
*Dr. Wm. L. Robinson, Danville	1896
*Dr. Geo. Ben Johnston, Richmond	1897
*Dr. Lewis E. Harvie, Danville	1898
*Dr. Jacob Michaux, Richmond	1899
*Dr. Hugh T. Nelson, Charlottesville	1900
*Dr. J. R. Gildersleeve, Tazewell	1901
*Dr. R. S. Martin, Stuart	1902
*Dr. J. N. Upshur, Richmond	1903
*Dr. Joseph A. Gale, Roanoke	1904
*Dr. Wm. S. Christian, Urbanna	1905
Dr. Lomax Gwathmey, Norfolk	1906
*Dr. Paul B. Barringer, Charlottesville	1907
*Dr. Wm. F. Drewry, Petersburg	1908
*Dr. Stuart McGuire, Richmond	1909
*Dr. E. T. Brady, Abingdon	1910
*Dr. O. C. Wright, Jarratt	1911
*Dr. Hugh M. Taylor, Richmond	1912
*Dr. Southgate Leigh, Norfolk	1913
*Dr. Stephen Harnsberger, Catlett	1914
*Dr. Samuel Lile, Lynchburg	1915
*Dr. Joseph A. White, Richmond	1916
*Dr. Geo. A. Stover, South Boston	1917
*Dr. Ennion G. Williams, Richmond	1918†
*Dr. Ennion G. Williams, Richmond	1919
*Dr. Paulus A. Irving, Farmville	1920
*Dr. Alfred L. Gray, Richmond	1921
*Dr. E. C. S. Taliaferro, Norfolk	1922
*Dr. John Staige Davis, University	1923
*Dr. W. W. Chaffin, Pulaski	1924
*Dr. Hunter H. McGuire, Winchester	1925
Dr. W. L. Harris, Norfolk	1926
*Dr. J. Shelton Horsley, Richmond	1927
*Dr. J. W. Preston, Roanoke	1928
*Dr. J. Bolling Jones, Petersburg	1929
*Dr. Charles R. Grandy, Norfolk	1930
*Dr. J. Allison Hodges, Richmond	1931
*Dr. I. C. Harrison, Danville	1932
*Dr. J. C. Flippin, University	1933
Dr. R. D. Bates, Newtown	1934
*Dr. F. H. Smith, Abingdon	1935
Dr. P. St. L. Moncure, Norfolk	1936
Dr. J. M. Hutcheson, Richmond	1937
*Dr. G. F. Simpson, Purcellville	1938
Dr. A. F. Robertson, Jr., Staunton	1939
*Dr. H. H. Trout, Roanoke	1940
Dr. W. B. Martin, Norfolk	1941
*Dr. Roshier W. Miller, Richmond	1942
Dr. J. M. Emmett, Clifton Forge	1943
*Dr. C. B. Bowyer, Stonega	1944
Dr. H. B. Mulholland, Charlottesville	1945
*Dr. Julian L. Rawls, Norfolk	1946
Dr. W. L. Powell, Roanoke	1947
Dr. Guy R. Fisher, Staunton	1948
Dr. M. Pierce Rucker, Richmond	1949
Dr. W. C. Caudill, Pearisburg	1950

*Deceased.

†Owing to influenza epidemic during World War I, the council met in 1918, and Dr. Williams was continued as President.

PUBLIC HEALTH

L. J. ROPER, M.D.,
State Health Commissioner of Virginia

The report of the Bureau of Communicable Disease Control of the State Department of Health for August 1950 as compared with the same month in 1949, and for the period of January through August 1950 as compared with the same period in 1949, is as follows:

	Aug. 1950	Aug. 1949	Jan.-Aug. 1950	Jan.-Aug. 1949
Typhoid and paratyphoid	16	20	57	90
Diarrhea and dysentery	524	1,407	2,702	3,918
Measles	84	136	2,476	21,237
Scarlet fever	32	24	619	456
Diphtheria	5	9	102	92
Poliomyelitis	312	111	547	163
Meningitis	6	11	93	66
Brucellosis	4	4	40	43
Rocky Mountain spotted fever	21	27	58	86
Tularemia	4	6	25	25

OBSERVATIONS ON THE 1950 POLIOMYELITIS OUTBREAK IN VIRGINIA

In this year of high incidence of poliomyelitis in Virginia, certain features of the outbreak are repeated which occurred in other years of high incidence. When a pattern recurs with regularity, it is assumed that chance is eliminated, and it is concluded that this particular pattern has significance. So far this significance has eluded students of the epidemiology of the disease. This recurring pattern relates to seasonal occurrence and to sex—race distribution of reported cases.

In regard to seasonal incidence, the peak of reported cases this year occurred the week ending August 12, with 94 cases reported. Succeeding weeks have shown 68, 67, and last week (Sept. 2) 48 cases. There are no clear cut reasons for this regularly repeated pattern of seasonal incidence. However, two theories have been advanced:

1. That hot weather activates the virus.
2. That hot weather lowers resistance of individuals attacked.

As regards the method of spread of poliomyelitis, most workers today accept the person to person theory as the most probable means of spread, though it is not possible with present day knowledge, to rule out other means of spread.

Another repeating pattern is the higher ratio of males attacked, over females. This is shown in Table I for recent years of highest incidence.

TABLE I

Year	Cases Reported	Percentage Males	Percentage Females
1944	826	52.8	47.2
1948	567	57.8	42.2
1950 (to Sept. 7)	597	57.6	42.4

It may well be that infection is no more common in males than in females, but that evidence of disease, such as paralysis, occurs more often in active males because they are less apt to call attention to mild illness, and be put to bed, than are females and less robust males. It has also been repeatedly observed that severe physical activity at the onset of an illness which may prove to be poliomyelitis is highly dangerous, as evidenced by the occurrence of paralysis following such activity. The husky male is the one who engages in such activity. The case of Franklin D. Roosevelt is cited in this connection.

The third parallelism observed in years of high incidence is the predominance of white over colored. Attack rates for white and colored are shown in Table II.

TABLE II

		Cases Reported	Attack Rate (per 100,000 pop.)
1944	White	674	31.7
	Colored	72	10.6
1948	White	511	21.0
	Colored	54	7.6
1950 (to Sept. 7)	White	530	21.8
	Colored	77	10.8

A possible explanation of the persistently lower attack rate reported for colored may be that mild subclinical cases of poliomyelitis in whites are more apt to be seen by a physician and be reported than are similar cases among colored.

Recently a possible correlation has been observed between inoculations performed several weeks prior to the onset of poliomyelitis and the site of paralysis. Results of an investigation by Hill and Knowelden, of the London School of Hygiene and Tropical Medicine, are reported in the *British Medical Journal*, July 1, 1950. Since their findings have been challenged on statistical grounds, the U. S. Public Health Service is accumulating evidence from other sources. Until the evidence is all in, it has seemed wise to advise the limitation of inoculation and immunization procedures during the poliomyelitis season, just as it is recommended that mouth and throat operations be avoided during high incidence years.

XUM

MEDICAL SOCIETY OF VIRGINIA

MEDICAL SERVICE COMMITTEE

Veteran Medical Care by Civilian Physicians

There are now in the United States over 19,000,000 veterans. It is estimated that 85 per cent of veterans under medical care have non-service connected disabilities. Almost everyone will agree that veterans with service connected illness or injury should receive complete and maximum care from veterans facilities. On the other hand, why should veterans with non-service connected short term illness not be cared for as any other civilian when the local facilities are available? It has become a common practice for any veteran regardless of his illness or of his financial status who desires care by a veterans hospital to sign a statement that he is unable to pay and to be admitted to the veterans hospital without any questions being asked or any investigation being made.

The number of veterans is steadily increasing. Medical care by the Federal Government is no different from other government projects in that the cost is much greater than the same care and service rendered on a private basis. The same illness which may keep a private patient hospitalized one week is likely to keep a patient in a veterans hospital three weeks. In the name of economy, then, local facilities should be used whenever available for veterans with non-service connected disabilities. If only veterans with service connected illnesses and perhaps those with certain long term disease were treated by the Federal Government it should become unnecessary to continue the construction of veterans hospitals on the present costly scale.

With regard to the present system of ambulatory treatment of veterans with service connected illness by local physicians, the theory is commendable but there are many details which should be revised. Every physician who has had duty in the armed forces knows that there will always be a plethora of paper work and red tape where the Federal Government is concerned but it does seem unnecessary for the forms to require whether phenobarbital was given in one-fourth grain doses four times a day or one-half grain doses twice a day. Otherwise, the forms may be returned marked "exact dosage?" Another weakness in the present system is that of requiring authorization beforehand for each patient visit. It may be that at the patient's first visit he will be found to have a condition which, though not an emergency, should have prompt treatment at frequent visits. At present, the alternative is to have the patient wait until authorization for additional visits can be obtained; or to treat the patient and take the chance of not having the request for authorization for additional treatments approved. Many busy practitioners are unwilling to treat any veterans under the present system because of the time consumed in paper work. This sometimes deprives the veteran of the physician of his choice unless he is willing to pay the fee himself.

It would seem that a plan could be devised whereby a physician might render treatment and services he considered necessary for a veteran patient and at stated intervals make a report—in triplicate, if necessary—and also remit a bill itemized according to a stated scale. This would put the authority to treat a veteran patient in the hands of the local physician where it belongs, and not in the hands of some distant secretary where it now is. Perhaps such a system would occasionally be abused, but the instances would likely be rare and the system would be much more flexible than the present one.

SNOWDEN C. HALL, JR., M.D.,
Danville, Virginia

MENTAL HEALTH

Joseph E. Barrett, M.D.,
Commissioner, Department of Mental Hygiene and Hospitals.

Occupational and Recreational Therapy in Our State Mental Hospitals.

One hundred years ago Dr. John M. Galt, superintendent of the institution then known as "Eastern Lunatic Asylum", advocated occupation, recreation, music, lectures and reading to "prevent the insane from lapsing into the dull torpor of reveries and indolence into which it is the very nature of man to sink if mind and body alike are left in a state of vacuity from want of means to occupy them". Since then such therapy sometimes has been neglected in the institutions maintained by the Commonwealth. The program being carried on today should be of interest to physicians who prescribe care in State institutions for some of their patients.

The rationale of this therapy is that activity favors the restoration of function. In mental medicine the psychic function is given more emphasis than the physical. However, we certainly cannot consider one to the exclusion of the other. Since the pathology is in the field of inter-personal relationships, group activities are more useful in this particular therapy.

Our philosophy is that recreation and occupation cannot be separately considered. A judicious mixture of work and play should be prescribed by a physician and carried out by therapists with sound psychiatric orientation. In our State hospitals the work is directed by professional personnel but we use other employees and often patients whenever it seems advisable. Although a completely integrated program is carried on, it is convenient to discuss it separately under occupation, recreation, and industry.

In the occupational field there is the usual range of arts and crafts such as sewing and needlework, woodwork, weaving, ceramics, painting, wood carving, and so on. The approach depends upon the type of patient, the duration and severity of his illness, and the prognosis. In the new patient it is, in the beginning, tentative and exploratory. An effort is made to develop an interest on the part of the patient in some activity which after his release from treatment can be a hobby or even a new occupation. If he is depressed or withdrawn the desirable medium is one which is stimulating and leads into group activity. If the patient is overactive, aggressive or morbidly elated a non-stimulating medium is selected in which contact with a group is limited. If the patient's occupation has been an irritating factor something else or something similar but more satisfying is selected. Another basic consideration is that the activity, of whatever nature, must make sense to the patient. It is not necessary that anything of value be produced, but meaningless work is pernicious and destructive in its effect on the patient. The late Dr. C. C. Burlingame, of the Hartford Institute of Living, told of a well-to-do banker with a depression who was put to weaving baskets and promptly attempted suicide, with the bitter comment that if he was only good for weaving baskets he might as well die.

With patients classified as chronically ill the emphasis is placed on re-socialization with the first goal being an effort to draw the patient into the hospital society and to establish more normal habits. These chronic patients are frequently our therapeutic failures. However, if these patients are left without any attention they become onerous problems of nursing and housekeeping care. Hence, the aim of the therapist is to aid them enough in their contact with reality so that they can care for their personal needs. Stimulating group activities prove most effective in these cases.

Almost a third of our State hospital admissions are from the older age group. Such patients seldom recover, or even improve to the point where they can re-adjust. The efforts of the therapist are to make their hospital adaptation as comfortable as possible, to prevent further regression and to maintain personal self-care as far as possible. Occasionally an old person is sufficiently well preserved physically to return to productive life if the psychological factors are properly evaluated and treated. If the patient can be given a feeling of usefulness, of being loved and wanted, of still being able to make a contribution to the economy and the society in which he is placed, the results are sometimes surprising. The activities for this group are selected with due regard for physical limitations; they should not be

XUM

too new to the individual and must be obviously useful.

There are special groups of patients who require modifications of our program. In patients undergoing insulin or electroshock therapy we take into consideration the restrictions and special hazards which complicate that therapy. Insulin patients must be kept under constant observation and precautions must be taken against secondary hypoglycemia. Electroshock patients have disturbances of memory and require constant reassurance and the therapist must not expect their intake and recall to be normal. In children (of whom we have a few) the therapy is built around a school program.

Recreational therapy consists mainly of group activities, with the goal being resocialization. Some individual work is carried out, just as in occupational therapy. In addition to the usual program of sports, moving picture shows, dances, bingo and card parties we carry on some less usual activities, such as afternoon teas, bus rides to historical points of interest and television shows.

Industrial therapy is the natural extension of occupational therapy. No individual is entirely healthy unless through his efforts he contributes to his support and to the welfare of the group. Hence, every patient is expected to contribute to the maintenance of the institution. Patients take part in housekeeping, in the food service, in the work of the farm and dairy, in the laundry, storeroom, mail room, office, etc. Usually a person is assigned to work in keeping with his previous occupation and training. Here, as in the other aspects of the program, therapeutic implications are kept foremost.

The following case from one of our State hospitals illustrates several of the points mentioned. The initial approach was on a purely individual basis. The patient was led naturally into socialized activities by first using another patient, and then a group. The means used was not one of the traditional crafts, and in the end it developed into a type of industrial assignment.

The physician's prescription after a month's observation read: "Get this patient out of bed and active. Interest her in using her hands and in walking. There are no complications other than the fact that she has been bedfast for a year prior to admission. Age 32." She lay in bed completely covered except for her pinched face and claw-like hands. The eyelids were closed, but at every sudden noise they twitched. The only sound was a light whimpering. She repudiated human needs, and food and conversation were both ignored.

The therapist introduced herself and stated that the doctor now felt that the patient was ready for some activity. With a very brief explanation of what was offered in the occupational therapy department the therapist left some magazines for the patient. No response was needed and the only one evoked was a wince. For a week various magazines and some knitting of very light weight, colorful yarn were left in the patient's room. The latter was ignored. The magazines were merely riffled. On Friday she was told that the therapist would come on Monday morning and the patient would be expected to be ready to go with her to the occupational therapy shop.

On Monday the patient remained in bed. Along with the ward personnel she was taken out and dressed. As she left with the group each step seemed that of a crippled invalid wracked with frightful pain. The therapist suggested, "Since you must attend these meetings you might select the type of activity which interests you", and named the crafts available. The first normal response was, "I've always wanted to learn to draw." During the seating of the group the patient refused a chair, remained backed into a corner, knees partially flexed, shoulders hunched, arms drawn up and hands curled, shielding her mouth and throat.

Materials for finger painting were assembled, the elementary techniques of the craft were explained on the basis that until the fingers and hands were relaxed drawing would be ineffectual. The first painting was a series of narrow gauge scratches made by the edges of the fingernails, using a bright red paint. A second painting was suggested and the patient selected a dull brown paint.

Her technique improved and some quite broad areas were done by the flat of her hands. To establish good work habits, the cleaning up process was explained to the patient. She picked up the bowl of water, contemplated her work and remarked, "Well, I still don't think that's much of a drawing, but I feel better."

The second day she went immediately to her work space and in the 85-minute work period did two paintings, both in a dull brown. Each was a line of

XUM

dancing figures in a rhythmic curving arrangement suggestive of music.

On the basis of these paintings the therapist began talking of music with no response from the patient. The choir held a service on the patient's ward and the patient was observed closely. At a sour note, the patient flinched. Conversation about favorite music, addressed to other patients, drew her into a discussion of the piano as a means of expression. Mildly humorous stories about learning to play elicited a faint smile. A casual remark, while hanging her painting, that piano playing was excellent exercise for tense hands brought forth the plaintive remark, "I used to like to play." It was suggested she try a brief period of playing to vary her work with finger paints, to hasten the relaxation of tense muscles.

After several weeks of this program the patient was asked to play for a small group of patients but refused because she felt unready. Other natural and manufactured openings met with the same fate when requested by the therapist.

Another patient who was studying voice needed an accompanist. It was suggested that she ask the pianist to work with her and this became a regular part of the patient's activity. When later the vocalist, who enjoys performing, was invited to sing at a tea, it followed that our patient would accompany her. Her success and the approbation received supplied impetus toward more activity alone and with others. The patient needed no more suggestion, she was ready and able to assume control of her life.

BOOK ANNOUNCEMENTS

Cerebral Palsy. By JOHN F. POHL, M.D., Orthopedic Surgeon, Michael Dowling School for Crippled Children, Minneapolis, Minnesota. Bruce Publishing Company, Saint Paul, Minn. 1950. xii-224 pages. Cloth. Price $5.00.

The Management of Obstetric Difficulties. By PAUL TITUS, M.D., Obstetrician and Gynecologist to the St. Margaret Memorial Hospital, Pittsburgh; Secretary of the American Board of Obstetrics and Gynecology; etc. Fourth Edition. The C. V. Mosby Company, St. Louis. 1950. xvi-1046 pages. With 446 Illustrations and 9 Color Plates. Cloth. Price $14.00.

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association. With the comments that have appeared in the Journal of the American Medical Association. 1949. Philadelphia, J. B. Lippincott Company. 231 pages. Cloth.

New and Nonofficial Remedies. Containing Descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1950. Issued Under the Direction and Supervision of The Council on Pharmacy and Chemistry of the American Medical Association. 1950. Philadelphia, J. B. Lippincott Company. 800 pages. Cloth.

Sir William Osler. Aphorisms from His Beside Teachings and Writings. Collected by Robert Bennett Bean, M.D. (1874-1944). Edited by William Bennett Bean, M.D. Henry Schuman, Inc., New York, 1950. 159 pages. Cloth. Price $2.50.

Immortal Magyar. Semmelweis, Conqueror of Childbed Fever. By FRANK G. SLAUGHTER, M.D. Henry Schuman, Inc., New York, 1950. 211 pages. Cloth. Price $3.50.

Cancer of the Colon and Rectum. Its Diagnosis and Treatment. By FRED W. RANKIN, B.A., M.A., M.D., LL.D., Sc.D., F.A.C.S., Surgeon, St. Joseph's and Good Samaritan Hospitals, Lexington, Kentucky; Clinical Professor of Surgery, University of Louisville. And A. STEPHENS GRAHAM, M.D., M.S. (in Surgery), F.A.C.S., Surgeon, Stuart Circle Hospital, Richmond, Virginia; Associate Professor of Surgery, Medical College of Virginia. Second Edition. Charles C. Thomas, Springfield, Ill. 1950. xiii-427 pages. Illustrated. Cloth.

Eyes and Industry. Formerly Industrial Ophthalmology. By HEDWIG S. KUHN, Hammond, Indiana. Second Edition. St. Louis, The C. V. Mosby Company. 1950. 378 pages. Illustrated. Cloth. Price $8.50.

Freud: Dictionary of Psychoanalysis. Edited by NANDOR FODOR, Associate of the Association for the Advancement of Psychotherapy. And Frank Gaynor, Co-Author of the "Dictionary of Industrial Psychology". With a Preface by Theodor Reik. Philosophical Library, New York. 1950. xii-208 pages. Cloth. Price $10.00.

Atlas of Roentgenographic Positions. By VINITA MERRILL. While Education Director, Picker X-Ray Corporation. In Two Volumes. St. Louis, The C. V. Mosby Company. 1949. 663 pages. Illustrated. Cloth. Price $30.00.

The bibliography alone makes this the most practical reference book for X-ray technicians and radiologists. Many roentgenographic positions and procedures, the unusual or specialized positions not used as part of a routine examination and not ordinarily included in most simplified textbooks are included in these two excellent volumes.

Each procedure is illustrated and described briefly and clearly. The drawings, radiographs and photographs are all worth while.

Every radiologist and x-ray department should own this work.

F. B. MANDEVILLE

XUM

EDITORIAL

Joseph Price (1853-1911)

JOSEPH PRICE was born January 1, 1853 in Rockingham County, Virginia, the son of Joshua and Phoebe Moore Price. He died in Philadelphia, June 6, 1911, strangely enough of peritonitis, a disease he had done so much to conquer. He received his early schooling at Fort Edwards, New York, and at Union College, and graduated in medicine at the University of Pennsylvania in 1877. His brother, Mordecai, who was eight years his senior, and who had an established practice in Philadelphia, paid for his education. Later Dr. Joe taught Dr. Mordecai all that he knew about surgery, a relationship reminding one of John and William Hunter. There was a similar difference in the dispositions of the two sets of brothers but the Price brothers did not fall out with each other. Joe Price was fond of athletics and outdoor sports. He was a boxer of ability and the best rifle shot in America, winning the championship at the Centennial World's Fair in 1876. Upon his graduation he was offered $3,500.00 to play professional baseball. However, he went to work in the Philadelphia Dispensary, the oldest free dispensary in America, where he organized the gynecological and obstetrical department. Later he was in charge of the Preston Retreat for eight years but he kept his connection with the Philadelphia Dispensary all his life.

His first abdominal operation was performed in the slums of Philadelphia in 1878. He had been sent by the coroner to do an autopsy as the patient was supposed to have died from a criminal abortion. The patient was not dead but was critically ill with peritonitis. He opened the abdomen and inserted a coffer dam of gauze and the patient recovered. This operating in the home was not so strange as it sounds today for much of the surgery of the time was done in the home. Price's simple but meticulous technic was especially adapted to such practice. He used few instruments, which he boiled, along with towels for drapes and he relied on copious soap and water for his hands. His sutures were mass sutures of silk worm gut. Even in his private hospital he boasted of his four dollar operating room. Nothing in it cost more than that amount. He emphasized cleanliness and essentials and frowned on frills. He maintained that a knowledge of obstetrics was essential to good gynecological surgery.

Lawson Tait has been called the Father of British Gynecology and Joseph Price, the American Tait. Both greatly enlarged the field of gynecological operations, particularly in inflammatory lesions and ectopic pregnancy, and the vaginal hysterectomy. In many ways they were much alike. Both were wondrously skilful, bold and courageous. Both loved controversy and both had a gift of making enemies. Here the parallel ends. Tait made enemies, apparently, because he liked to do so; Price did so entirely impersonally and only in sustaining his surgical principles. Many of those he most bitterly attacked remained his best friends. Tait was an excellent business man. Price cared nothing about money, and never mentioned dollars and cents in his conversation. His brusqueness in medical debate was in great contrast to his kindness and gentleness in his dealings with his patients, especially his charity patients. He saw to it that even the poorest colored woman in his private hospital had a special nurse for 48 hours after an operation. She was not to be left alone under any circumstances. The superintendent of his hospital had standing orders to find a place for an emergency patient even if she herself had to give up her own room and go to a hotel. His private life was above reproach.

However, what the public has to thank Joe Price for the most is his teaching. Al-

XUM

though he was never connected with a teaching institution he taught more gynecology and surgery than anyone in his time. McMurtrey, in his presidential address to the American Medical Association, said: "There are few prominent operators in America who do not in some way show the handiwork of Doctor Joseph Price." Visiting surgeons, from all over the country and from abroad, came to see him operate. Will Mayo tells how his own mortality in Rochester dropped 12 per cent in his ovarian surgery after visiting with Price for three weeks. He further said that the three men to whom the world was most indebted in abdominal surgery were Price of America, Pean of France, and Tait of England. Dr. Howard Kelly wrote "Dr. Price was a pioneer in the newer aggressive surgery, and a great leader and teacher of other men. He did more than any man I know to fashion the methods we practice today. He realized that infection was mainly to be avoided through strict cleanliness and became an apostle of asepsis as contrasted with antisepsis. He was brilliant as an operator, achieving the greatest results by the simplest methods. He was a warm, true, devoted friend and a most charming, racy conversationalist. Simple and unpretentious, he hated all sorts of shams. I have never known a man in our generous optimistic profession to be kinder to the poor, irrespective of race. Of Virginia stock with a background of tradition of the plantation, his heart ever went out to the colored woman under his care."

This is the 16th of a series of "Doctors for whom the public should be thankful."

Doctors Needed in Korea

THERE has been much unfavorable comment in the newspapers and lay journals about the slowness with which doctors are volunteering for service in the present "war". The public seems to be surprised particularly at the lack of enthusiasm of those V-12 and ASTP men who received their medical education at the hands of the government and who have had no compensatory military service. This is so contrary to the behavior of medical men in past wars that the public cannot understand it.

Many explanations have been suggested. One is that this is not a war but a police action of the United Nations and is no business of the United States itself. Another is that the operations are on the other side of the earth and that this country is in no danger of being invaded. This, of course, is open to question. Be that as it may, and call the Korean situation by whatever name you please, the fact remains that our boys are being killed and wounded. They need medical attention. A third explanation that has been suggested is that the U.S. Army has a medical pool of 29,000 doctors in the reserves which has not been touched and also has enough doctors to attend the wives and children of the enlisted men.

A fourth explanation may be the blighting effect of Federal control. May it not be a foretaste of Federalized medicine? The Federal Government bought and paid for the medical services of these young men. When the Federal Government buys and pays for anything it takes the very spirit out of it. We hope we are wrong about this, for our fighting men must have the medical support they have always had and which they have every right to expect.

XUM

J. Bolling Jones, M.D., (1871-1950)

THE most colorful past-president of the Medical Society of Virginia died in a Richmond Hospital, Friday, September 1, 1950, after an illness of several months. Dr. Bolling Jones was known and loved by doctors throughout Virginia. He was untiring in work for the Society and for years was a valuable member of the Legislative Committee. In 1928 he received the highest honor to which a Virginia doctor is eligible. He was elected President of the Medical Society of Virginia. In more recent years his report as Chairman of the Necrological Committee has been a feature of our annual meetings. With dignity but without undue solemnity he has reported the deaths of our fellows.

John Bolling Jones was born in Dinwiddie County February 27, 1871. He attended Sunnyside School in Dinwiddie County and Mount Hermon School in Massachusetts. In 1893 he graduated at the Medical College of Ohio (now the Medical Department of the University of Cincinnati). After serving as resident physician at the Good Samaritan Hospital in Cincinnati, he passed the Virginia State Board of Medical Examiners (1894) and located in Chesterfield County. Characteristically he took an interest in the county's affairs and was elected a member of the County Board of Health. In 1897 he moved to Petersburg where he became a leading citizen as well as its busiest practitioner. Among his many honors were presidency of the Petersburg Medical Faculty, the Dinwiddie County Medical Society, the Petersburg Hospital Staff and the Southside Virginia Medical Society. For years he was a member of the Medical Examining Board of Virginia. At every opportunity he attended medical meetings and frequently took part in the discussions—always with vigor and always in good humor, so much so that it was a pleasure to get into a discussion with him.

He was a member of the Tabb Street Presbyterian Church and was fond of long cigars and of fox hunting.

On July 7, 1896 Dr. Jones married Miss Janie Duckett of Clinton, S.C., who predeceased him in May. He is survived by four sons, four daughters, three sisters, two brothers, eighteen grandchildren and a great-grand child. Two of his sons, T. Duckett Jones and Herbert C. Jones and one daughter, Mrs. J. Randolph Perdue, are Doctors of Medicine.

We shall greatly miss our stimulating colleague. His like will not be seen again.

NEWS

The Roanoke Meeting.

A large gathering is expected at the meeting of the Medical Society of Virginia in Roanoke this month. Business sessions start on Sunday, the 8th, and, as an innovation, there will be a dinner meeting that evening for members of the House of Delegates.

The scientific program will commence Monday morning at 9:00 a.m. That afternoon there will be a Clinicopathological Conference, sponsored by the Medical College of Virginia and the Medical Department of the University of Virginia. The President, Dr. W. C. Caudill of Pearisburg, will speak that evening as will also two of his guests, U. S. Senator Harry Flood Byrd and Colonel William L. Wilson of Washington.

Tuesday afternoon, Dr. Franklin D. Murphy, another guest, will speak on Post-Graduate Education for the Practicing Physician, and that evening will be held the cocktail party, dinner and entertainment.

Reserved for the final session on Wednesday is a Symposium on Progress in Medicine, those taking part in this being Dr. George T. Pack (guest) of

New York City, Dr. William Parson of the University of Virginia, Dr. Russell L. Haden of Crozet (formerly with the Cleveland Clinic), and Dr. Harvey B. Haag of the Medical College of Virginia.

There will be excellent exhibits, both scientific and technical, and recess will be taken in each session to permit members to visit these. Moving pictures will also be shown at various hours, so there will be much to be both heard and seen. The hospitality of the Roanoke hosts is so well known that we feel all members who can will arrange to attend.

The Virginia Section of the Diabetes Association

Has arranged the following program for its meeting to be held in Roanoke, Sunday afternoon, October 8, at 3:00 p.m., preceding the meeting of the Medical Society of Virginia:

PROGRAM

I. Bronze Diabetes—Dr. William A. Read, Newport News.
II. Hyperglycemia Accompanying Cerebral Vascular Accidents—Dr. Edward D. Levy, Norfolk.
III. Hyperthyroidism Associated with Diabetes (Case Report)—Dr. Robert Crawford, Roanoke.
IV. Treatment of Diabetic Acidosis with Hypotonic Saline Instead of Normal Saline—Dr. Richard Neubauer, Richmond.
Discussion—Dr. H. St. George Tucker, Jr., Richmond.
V. Diabetes and Coronary Heart Disease—Dr. Ernest G. Scott, Lynchburg.

All members of the Medical Society of Virginia are invited to attend this meeting.

Albemarle County Medical Society.

In January, Dr. W. Roy Mason was elected president of this Society, Dr. George Cooper, Jr., vice-president, and Dr. Thomas S. Edwards was re-elected secretary-treasurer. Since then Dr. Mason has left the University of Virginia to be student physician at Emory University, Georgia, and Dr. Cooper has succeeded to the presidency for the balance of 1950.

The Southern Psychiatric Association

Will hold its annual meeting in Williamsburg, November 27 and 28, under the presidency of Dr. R. Finley Gayle of Richmond. Dr. Joseph E. Barrett of Williamsburg and Richmond is chairman of entertainment. Dr. Newdigate Owensby of Atlanta is secretary of the Association and Dr. R. Burke Suitt of Durham, N. C. is president-elect and will succeed to the presidency at the end of this meeting.

Postgraduate Courses.

The Council on Postgraduate Medical Education of the American College of Chest Physicians announces that it will sponsor two Postgraduate courses in Recent Advances in Diseases of the Chest. The first postgraduate course will be held at the St. Clair Hotel, Chicago, October 16-20, 1950, and the second course will be held at the Hotel New Yorker, New York City, November 13-18, 1950.

Tuition for each course is $50.00. Applications will be accepted in the order in which they are received as registration will be limited. Address all inquiries and applications to the Council on Postgraduate Medical Education, 500 North Dearborn Street, Chicago 10, Illinois.

Dr. Maurice M. Bray,

Recently at the University Hospital, Charlottesville, has moved to Suffolk and joined the staff of Lakeview Hospital.

The Neuropsychiatric Society of Virginia

Is meeting on October the 4th at Westbrook Sanatorium, Richmond, under the presidency of Dr. James K. Morrow of Radford. Dr. James B. Funkhouser of Richmond is secretary.

Dr. Joseph Hughes, Psychiatrist, Institute of Pennsylvania Hospital and Professor of Psychiatry, Women's Medical College of Pennsylvania, will be the guest speaker and his topic will be "Treatment of Anxiety States". It is also planned to have Dr. Joseph E. Barrett discuss the new commitment laws at this time. Members of the Society will be the guests of Westbrook Sanatorium.

Gill Hospital Spring Graduate Course.

At the twenty-fourth Annual Spring Graduate Congress to be held by Gill Memorial Hospital, Roanoke, April 2 to 7, 1951, some of the guest speakers include:

Dr. Edwin N. Broyles, Baltimore.
Dr. E. C. Kendall, Rochester, Minn.
Dr. Paul Holinger, Chicago.
Dr. John R. Lindsay, Chicago.
Dr. Lawrence Pool, New York.
Dr. D. H. Anthony, Memphis.
Dr. Robert H. Sinskey, Durham, N. C.

XUM

Dr. J. A. Sullivan, Ontario, Canada.
Dr. Robert H. Trueman, Philadelphia.
Dr. William P. McGuire, Winchester, Va.
Dr. Harold Scheie, Philadelphia.
Dr. R. W. Hollenhorst, Rochester, Minn.
Dr. Wendell Hughes, Hempstead, N. Y.
Dr. J. Gordon Cole, New York.
Dr. Harvey Thorpe, Pittsburgh.
Dr. Bryon Smith, New York.
Dr. A. D. Ruedemann, Detroit.
Dr. Edwin W. Burton, Charlottesville, Va.

Dr. Charles H. Peterson,

Roanoke, accompanied by Mrs. Peterson, attended the Sixth International Congress of Radiology in London in July and while away spent several weeks touring the British Isles.

On Staff of Memorial Guidance Clinic, Richmond.

Dr. William H. Kelly, director, has announced the appointment of Dr. Sidney Haber to the staff of the Memorial Guidance Clinic of Richmond. Upon leaving the Army three years ago, Dr. Haber became a resident psychiatrist at Menninger Foundation School of Psychiatry, Topeka, Kansas. During the past year, he spent most of his time at the Southard School for Problem Children.

Dr. Blackford Honored.

A portrait of the late Dr. Staige Davis Blackford, organizer and director of the Army's Eighth Evacuation Hospital Unit, was presented to the Medical Department of the University of Virginia during the recent reunion of the unit in Charlottesville.

Detecting Hidden Diabetes.

The Diabetes Detection Drive and Diabetes Week has been sponsored by the American Diabetes Association and is approved by the American Medical Association. It is planned as a public service with no public solicitation of funds. Diabetes Week last year was instrumental in detecting a number of unsuspected cases. With the cooperation of businesses and industries in this year's drive, many hidden diabetics among their employees can be discovered, treated, and retained on their jobs improved in health and working efficiency. Diabetes Week is scheduled for November 12-18. Help in this drive as far as possible.

Virginia Crusade for Freedom.

General Lucius D. Clay, national chairman of the Crusade For Freedom, has appointed General J. Fulmer Bright, medical director of the Virginia Industrial Commission, as Crusade Chairman for the State of Virginia. General Bright will head the Virginia organization to enroll Americans on Freedom Scrolls which will be permanently enshrined in the base of the 10-ton Freedom Bell to be hung in Berlin behind the Iron Curtain next October.

Dr. Bright, formerly a practicing physician of Richmond, has been quite active in the political life of this community for a number of years.

Radiological Society of North America.

The 36th annual meeting of the Society will be held in Chicago, December 10 through the 15th, under the presidency of Dr. Warren W. Furey, M.D. of Chicago. Headquarters will be the Palmer House in which all scientific and technical sessions will be held. Scientific exhibits are also to be displayed in the hotel. More than 60 papers as well as refresher courses feature the convention program.

Dr. Wendel G. Scott of St. Louis, Missouri, will present the annual Carmen Lecture. All members of the medical profession are welcome and invited.

Dr. Andrew K. Butler,

Recently radiologist at Riverside Hospital, Newport News, has moved to Wheeling, West Virginia, where he has accepted a similar position with the Ohio Valley General Hospital.

Dr. Thomas M. Scotti

Resigned his position as associate professor of Pathology at the Medical College of Virginia, Richmond, as of July 31, and accepted the position as pathologist in the Armed Forces Institute of Pathology at Washington, D. C. He is making his home in Falls Church.

Dr. D. Lane Elder

Has been renamed Mayor of Hopewell by the City Council at its reorganization meeting early in September. Dr. Elder has served on the Council for 31 years and has been Mayor for most of that time.

Essay Award, American College of Chest Physicians.

Dr. Eli H. Rubin, New York, Chairman of the Committee on College Essay of the American College of Chest Physicians, announced the winner of

the first award at the President's banquet in San Francisco, June 24, at the time of the 16th annual meeting of the College. The winner of the award of $250.00 was Dr. Henry A. Zimmerman of the Cardio-Vascular Laboratory, Cleveland City Hospital, Cleveland, Ohio, who is also a Fellow in the Department of Medicine at Western Reserve University. The title of his paper was "A Study of the Pulmonary Circulation in Man". This will be published in a future issue of Diseases of the Chest.

Dr. Joseph T. Phillips, Jr.,

Who has been practicing in Newport News, has moved to Welch, West Virginia, where he is connected with the Stevens Clinic Hospital.

Van Meter Prize Award.

The American Goiter Association again offers the Van Meter Prize Award of Three Hundred Dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the Association to be held in Columbus, Ohio, May 24, 25 and 26, 1951, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double spaced copy in duplicate sent to the Corresponding Secretary, Dr. George C. Shivers, 100 East Saint Vrain Street, Colorado Springs, Colorado, not later than March 1, 1951. The committee who will review the manuscripts is composed of men well qualified to judge the merits of the competing essays.

Dr. S. E. Hughes, Jr.,

Formerly of Danville, now of Lantana, Florida, has been appointed as assistant medical director of the Southeastern State Sanatorium near West Palm Beach.

New National Formulary IX Now Available.

The Council of the American Pharmaceutical Association has announced publication of the Ninth Edition of the National Formulary, which is one of the official compendia for drugs under the provisions of Federal State Food, Drug, and Cosmetic Laws. The book is published by the Mack Publishing Company in Easton, Pennsylvania, and is procurable through most wholesale drug houses.

Wanted—

Relief doctor for a full month. Must have Virginia license. House, jeep and board furnished with attractive salary. Must be sober. Write William A. Cover, M.D., Big Rock, Virginia. (*Adv.*)

Wanted Contract Practice.

Physician desires contract practice in either industrial section or coal mining area with guaranteed salary and opportunity for developing private practice. Give particulars in first letter. Address: "Contract Practice", care *Virginia Medical Monthly*, 1200 East Clay Street, Richmond 19, Virginia. (*Adv.*)

For Sale—

Burdick Mercury Quartz Ultra Violet Lamp Type QA-450-N. $150.00. Like new. Property of Dr. W. A. McGee. Call or write Mrs. P. H. Neal, Secretary, 5-4910, 1624 Park Avenue, Richmond 20, Va., for particulars. (*Adv.*)

Office Space Designed for Doctor and Dentist

Over new drug store. Air conditioned and heated. Located in fast growing section of Henrico County on Mechanicsville Pike about one mile from Richmond city limits. On bus line. Near school. Neighborhood of 6,000 families. Available now. For more information call J. Leslie Hughes, Richmond 2-2210. (*Adv.*)

Office Available.

Doctor's or dentist's office available in Richmond immediately. Corner of Harrison and Franklin Streets. Call 5-4397. (*Adv.*)

Convalescent Home.

"Durell Haven", Arrington, Nelson County, Va., open for a limited number of convalescent or elderly people. All modern conveniences. Write Laura B. Horsley, R. N., Arrington, Va. (*Adv.*)

OBITUARIES

Dr. J. Bolling Jones,

Petersburg, a former president of the Medical Society of Virginia, died September 1. A notice on Dr. Jones appears in the editorial pages of this issue of the MONTHLY.

Dr. David M. Kipps,

Beloved physician and citizen of Front Royal and dean of Front Royal doctors, was stricken suddenly by coronary thrombosis and died August 17. He followed his accustomed duties the day before and entertained friends in his normal genial manner.

Dr. Kipps was graduated from the College of Physician's and Surgeons of Baltimore in March 1888, and began the practice of medicine in Wardensville, W. Va., later locating in Burlington, W. Va. He came to Front Royal in 1892 and had practiced in the town and in Warren County continuously until his death, a period of 58 years. Since 1932 he had been coroner for Warren County.

Dr. Kipps kept abreast of medical advances through the years, and was a member of the Medical Society of Virginia (of which he was a Life Member), the Medical Society of Northern Virginia and the Medical Society of the Valley of Virginia, and had served as President of the last two. He was on the medical staff of the Front Royal Community Hospital and Warren Memorial Hospital, Inc. Keenly interested in Civic affairs, Dr. Kipps was a member of the local Chamber of Commerce. He was a Lutheran since boyhood, and Charter member of Good Shepherd Lutheran Church of Front Royal.

He was born near New Market, Va., and was 84 years and 8 months old. Dr. Kipps was twice married, his first wife being Miss Susan Jane Trout of Ridgeville, West Virginia, who died fourteen years ago. A son Edwin Trout Kipps survives. In December 1938, Dr. Kipps married Miss Lucy K. Laws of Front Royal, who survives him.

E. L. G.

Dr. Dudley Crofford Smith,

Charlottesville, died in a Washington hotel following a heart attack, while on his way to a convention in Philadelphia. He graduated from the University of Mississippi in 1914 and entered the University of Virginia Department of Medicine, from which he graduated in 1916, following which he joined the faculty of the medical school. He was professor of dermatology and syphilology and had taken a prominent place in this specialty, having served for sometime as chairman of the Venereal Disease Control Committee of the Medical Society of Virginia, and in June was named chairman of the section on this specialty of the American Medical Association. He had also been active in a number of other medical organizations and was a member and past president of the local Rotary Club. Dr. Smith was a native of Mississippi and fifty-seven years of age. Besides his mother, he is survived by his wife and two children.

Dr. George A. Renn,

For sixty years a practicing physician in Norfolk, died August 29, at the U. S. Marine Hospital in that city. A specialist in treating diseases of the eye, he was this year elected an honorary member of the Virginia Society of Ophthalmology and Otolaryngology. He was a native of Raleigh, N. C. and he received his degree in medicine from the New York University Medical School in 1889. He practiced for a time in New York before locating in Norfolk in 1903 after his return from duty with the Army in the Philippines. He was a member of the Norfolk County Medical Society and a Life member of the Medical Society of Virginia.

Dr. James N. Higginbotham,

For many years a well known physician of Tazewell County, died July 12, after a very protracted illness. His wife survives him. Dr. Higginbotham was sixty-eight years of age and a graduate of the Medical College of Virginia in 1906. He practiced for a number of years at Burkes Garden before moving to Tazewell. He was a member of the Medical Society of Virginia.

Dr. George W. Gay, Jr.,

Richmond, who became a Life member of the Medical Society of Virginia at its 1949 session, died August 27 at the age of 69. He was a native of Scotland Neck, N. C., and a graduate of the former University College of Medicine, Richmond, in 1899. He was a Mason and a member of Woodmen of the World. A nephew, Dr. George W. Gay, III, survives him.

Dr. Elmer Richard Moorman,

Who held the rank of commander in the medical branch of the Navy, died at his home at Kilmarnock, August 13. He was fifty-four years of age and a graduate of the Medical College of Virginia in 1930. He had practiced in Kilmarnock for a number of years before he entered the Navy in 1942 and was at that time a member of the Medical Society of Virginia. His wife and two daughters survive him.

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